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ABSTRACT

The design and methodology of the program of assessment is described and the student achievement data generated by the assessment are presented. Test results are reported for each goal area, each objective, and each test item by all 9-, 13-, and 17-year-olds, and by males and females within each age group. The results on test items in common with the three age groups are compared. Comparisons are made between groups of students formed on the basis of responses to questionnaires. The results of each age group are compared to the performance of students nationally. Results of a student questionnaire and of a principal questionnaire are reported. Copies of instruments are contained in the appendix. (MP)

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Connecticut Assessment of Educational Progress 1976-77

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TECHNICAL REPORT

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TITLE: Connecticut Assessment of Educational Progress
Mathematics
1976-77 Results Report

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Focus to the Reader

- If you are interested in a detailed breakdown of the achievement of Connecticut students on each test item—turn to Chapter 2 and Appendix A.

- If you would like to know how Connecticut students performed on each objective and goal area—turn to Chapter 2.

- If you want to study differences in achievement across different age groups of students within Connecticut—turn to Chapter 3.

- If you want to compare the achievement of selected groups of Connecticut students as defined by each region, size of community, and sex of student—turn to Chapter 4 and Appendix B.

- If you want to compare the achievement of selected groups of Connecticut students as defined by responses to questionnaires administered as part of the program—turn to Chapter 4 and Appendix E.

- If you want to compare Connecticut students' performance with that of students across the nation and in the Northeast region—turn to Chapter 5.

- If you are interested in Connecticut students' responses to questions about their home and school life—turn to Chapter 6.

- If you would like to know how principals in Connecticut described aspects of their schools—turn to Chapter 7.

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CHAPTER 1

DESIGN AND METHODOLOGY

Overview

The state of Connecticut conducted the fifth annual Connecticut Assessment of Educational Progress (CAEP) in 1976-77. Three age levels (9-, 13-, and 17-year-olds) were assessed in the subject area of mathematics. The Connecticut Assessment of Educational Progress, as mandated by the Connecticut General Assembly, is a continuing program designed to "measure objectively the adequacy and efficiency of the educational programs offered by the public schools."

The CAEP program is modeled after the National Assessment of Educational Progress (NAEP) in its basic goals, design, and instrumentation. NAEP was founded in 1964 and began actual testing in 1969 with the goal of providing continuous systematic reporting on the knowledge, skills, understanding, and attitudes of American children and young adults based on annual national surveys. Each year one or more subject areas (or related subject areas) are tested. The NAEP testing program generates data on national achievement levels against which statewide data can be compared.

CAEP began in 1971-72 with an assessment of reading achievement. In 1973-74 career guidance was assessed, in 1974-75 science, and in 1975-76 reading was assessed again. In coming years, Connecticut plans to continue annual assessment in a given subject area or areas in order to continually evaluate the adequacy of the educational system within the state.

The 1976-77 assessment in mathematics was conducted by National Evaluation Systems, Inc. (NES), Amherst, Massachusetts, under contract to the Connecticut State Department of Education (CSDE). The goals of the mathematics assessment were (1) to collect baseline data for determining student growth in mathematics knowledge in future years, (2) to collect information permitting the comparison of the present mathematics achievement of Connecticut students with the achievement of students nationally, (3) to provide achievement results useful in decision-making regarding curricula and instruction at both the state and local levels, and (4) to encourage school districts to adopt criterion-referenced assessment procedures for local planning and evaluation.

In response to these purposes, the program included the development and administration of three criterion-referenced mathematics tests, one for each of the three age levels assessed. These tests were administered on a statewide basis to a probability sample of 9-, 13-, and 17-year-olds. In designing the tests, an advisory panel of Connecticut educators developed high-priority mathematics learning objectives for the state, drawing heavily on NAEP materials. In conjunction with the statewide assessment, CSDE provided a valuable opportunity to local school districts by offering the state's custom-designed materials for use in comprehensive testing of their own students. This portion of Connecticut's assessment activities, called "Phase 2: The Local Assessment Option," permitted participating districts to use the statewide tests for local planning and evaluation. Only the methodology of Phase 2 is described in this report. All local achievement results were reported to the respective districts.

This report does contain, however, a complete description of Phase 1 of CAEP, the statewide testing program. The report describes in detail the design and methodology of the program, as well as presenting the student achievement data generated by the assessment. This information can serve as a valuable resource to CSDE and to others in determining strengths and weaknesses of Connecticut students in the area of mathematics. Considerations of and action in response to these findings may bring about improvements in the education of Connecticut students.

Outline of This Report

This report consists of several major parts. Chapter 1 describes the design and methodology of the study, including development of testing materials, sampling, test administration procedures, data analysis procedures, and a description of the Local Option.

Chapter 2 presents the results of the tests of Connecticut 9-, 13-, and 17-year-olds on each test item and for each objective and goal area.

Chapter 3 compares results across age groups on items administered to more than one age group within Connecticut.

Chapter 4 compares test results for selected groups of Connecticut students, groups defined by responses to questionnaires administered as part of the program.

Chapter 5 presents a comparison of the test performance of Connecticut students with that of students in the nation and in the Northeast region tested by NAEP. These comparisons are available only for those test items developed by NAEP and administered at the same age level by both CAEP and NAEP.

Chapters 6 and 7 present the complete results of the student and principal questionnaires, respectively.

Measurement Instruments

The design of the assessment required extensive developmental activities aimed at the production of (1) customized achievement tests comprised of exercises referenced to important learning objectives in mathematics, (2) student questionnaires with which to collect information on individual student and home variables, and (3) principal questionnaires with which to collect information on school-related variables. These developmental activities were the primary responsibility of the Mathematics Advisory Committee (MAC), composed of educators from across the state involved in many aspects and levels of mathematics education.

Achievement tests. The first activity of MAC was the development of appropriate instruments with which to measure student achievement in mathematics. In order to accomplish this task the committee selected goal areas and identified high-priority objectives for each of the three target age groups within Connecticut. Tables 1.1, 1.2, and 1.3 list the

TABLE 1.1

Mathematics Objectives (Grade 4/9-Year-Olds)

Goal Area	Objective
MATHEMATICAL CONCEPTS	1. The student demonstrates an understanding of place value for whole numbers.
	2. The student demonstrates an understanding of ordering of whole numbers.
	3. The student demonstrates an understanding of fractional notation.
COMPUTATION	4. The student demonstrates the ability to add whole numbers.
	5. The student demonstrates the ability to subtract whole numbers.
	6. The student demonstrates the ability to multiply whole numbers.
MEASUREMENT	7. The student demonstrates the ability to convert U.S. units of currency to larger or smaller units.
	8. The student demonstrates the ability to identify and compute time from a clock face.
	9. The student demonstrates a working knowledge of linear units of measure.
PROBLEM SOLVING	10. The student demonstrates the ability to solve word problems involving mathematical skills.
	11. The student demonstrates the ability to solve word problems involving real world situations.
CHARTS AND GRAPHS	12. The student demonstrates the ability to interpret data from charts and graphs.

TABLE 1.2

Mathematics Objectives (Grade 8/13-Year-Olds)

Goal Area	Objective
MATHEMATICAL CONCEPTS	1. The student demonstrates an understanding of rational numbers in the form of fractions and decimals. 2. The student demonstrates an understanding of ordering of decimals, fractions, and whole numbers.
COMPUTATION	3. The student demonstrates the ability to add and subtract whole numbers. 4. The student demonstrates the ability to multiply whole numbers. 5. The student demonstrates the ability to divide whole numbers. 6. The student demonstrates the ability to add and subtract decimals. 7. The student demonstrates the ability to multiply decimals. 8. The student demonstrates the ability to add and subtract fractions and mixed numbers. 9. The student demonstrates the ability to multiply fractions and mixed numbers.
MEASUREMENT	10. The student demonstrates a working knowledge of area and perimeter. 11. The student demonstrates the ability to convert a U.S. unit of measure to larger or smaller units. 12. The student demonstrates knowledge of metric units of measure.
CHARTS AND GRAPHS	13. The student demonstrates the ability to interpret data from charts and graphs.

TABLE 1.2 (continued)

Goal Area	Objective
APPLICATIONS	14. The student demonstrates the ability to solve word problems involving mathematical skills. 15. The student demonstrates the ability to solve word problems involving real world situations.
GEOMETRY	16. The student demonstrates knowledge of basic geometric concepts.

TABLE 1.3

Mathematics Objectives (Grade 11/17-Year-Olds)

Goal Area	Objective
MATHEMATICAL CONCEPTS	1. The student demonstrates an understanding of rational numbers in the form of fractions and decimals.
	2. The student demonstrates an understanding of ordering of decimals, fractions, and whole numbers.
COMPUTATION	3. The student demonstrates the ability to add and subtract whole numbers.
	4. The student demonstrates the ability to multiply whole numbers.
	5. The student demonstrates the ability to divide whole numbers.
	6. The student demonstrates the ability to add and subtract decimals.
	7. The student demonstrates the ability to multiply and divide decimals.
	8. The student demonstrates the ability to add and subtract fractions and mixed numbers.
	9. The student demonstrates the ability to multiply and divide fractions and mixed numbers.
MEASUREMENT	10. The student demonstrates a working knowledge of area, perimeter, and volume.
	11. The student demonstrates the ability to convert a U.S. unit of measure to larger or smaller units.
	12. The student demonstrates knowledge of metric units of measure.
CHARTS AND GRAPHS	13. The student demonstrates the ability to interpret data from charts and graphs.

TABLE 1.3 (continued)

Goal Area	Objective
APPLICATIONS	14. The student demonstrates the ability to solve word problems involving mathematical skills.
	15. The student demonstrates the ability to solve word problems involving real world situations.
GEOMETRY	16. The student demonstrates the ability to solve problems involving basic geometric concepts.

goal areas and the objectives within each goal area for 9-, 13-, and 17-year-olds, respectively. The committee then selected appropriate test exercises to match each objective.

The following guidelines directed the development of each of the three tests:

- The domains assessed should focus on basic mathematics concepts, computational skills, basic concepts of measurement and geometry, and practical application of these skills in problem-solving situations.
- All objectives at each age level should meet the criterion of expressing mastery in relation to content that can be assumed to be within the educational experience of *all* children at that level.
- In no way should the objectives to be tested attempt to represent *all* of the skills and concepts being taught at each level.

The process of selecting test exercises began with a review of NAEP materials, with careful attention to Connecticut's priorities. Where NAEP exercises did not suffice, they were supplemented by materials from the NES item bank; the Newington (Connecticut) Evaluation Program; the West Hartford (Connecticut) Individualized Mathematics Program; and by items developed by the committee under the supervision of NES staff.

MAC met seven times over a period of several months to define the three test instruments and the questionnaires. After careful review and examination of the materials, the committee selected the following number of items at each age level:

- At the 9-year-old level 60 items were selected.
- At the 13-year-old level 66 items were selected.
- At the 17-year-old level 64 items were selected.

A number of the items on the tests were drawn from NAEP materials, some modified minimally or substantially. However, there were 14 items for 9-year-olds, 17 items for 13-year-olds, and 20 items for 17-year-olds that were identical (unmodified) NAEP items.

Many of the items were administered to more than one age group—that is, appeared on more than one test. Four items were administered to 9- and 13-year-olds only, 38 items to 13- and 17-year-olds only, and six items to all age groups. Of the total 60 items for 9-year-olds, 50 were unique to that age group; of the 66 items for 13-year-olds, 18 were unique; and of the 64 items for 17-year-olds, 20 were unique.

The majority of items were in multiple-choice format, although a number of open-ended exercises were included in order to retain comparability with NAEP format. The items were assembled into one test booklet for each age level. Administration time was one hour for 9-year-olds and 13-year-olds, and 50 minutes for 17-year-olds. Copies of the test exercises appear in Appendix A of this report.

Appendix A gives the percentage of students selecting each response for each item on the tests. Appendix B gives the percentage of students responding correctly to each item, referenced by region and size of community (as defined by the sampling plan; see pages 14-20) as well as by sex of student.

Student and principal questionnaires. Following the development of the achievement tests, the advisory committee focused on the task of designing questionnaires which would be used to collect information on student, home, and school variables which might be shown to be related to achievement. The student questionnaires were similar, although not identical, for the three age levels, and were printed at the front of each test booklet. The principal questionnaire was mailed to principals of all schools involved in statewide testing.

There were 11 questionnaire items for 9- and 13-year-olds, and 13 items for 17-year-olds. Copies of the student questionnaires appear in Appendix C of this report. The student questionnaire items dealt with such things as the sex of the student, the amount of television watched by the student, the degree of parental involvement in and encouragement of the student's schoolwork, and the student's attitudes toward mathematics and school.

The principal questionnaires contained 10 identical questions for the principals of 9- and 13-year-olds, and nine questions for those of 17-year-olds. The questionnaires, administered to principals of all participating schools, included questions on the size of the school, the size of the mathematics classes, the number of teachers and aides assigned to mathematics classes, the type of classroom organization in the school, program development activities, and problems related to mathematics education in the school. Principals' responses to the questionnaires were matched to the data record of each student in that school so that the performance of students could be related to factors in the school environment. Copies of the principal questionnaires appear in Appendix D of this report.

Sampling Design

In order to increase the reliability of the data collected and to reduce the impact on schools of statewide testing activities, a sampling approach to assessment was adopted. A two-stage, stratified cluster design was used to select a separate random sample for each age level. The sampling plan, which was the same for each of the three age groups, adhered to the following set of standards:

(1) All public schools enrolling students of the given target age were included in the student sampling frame.

(2) The sampling of schools and students was done on a probability basis.

(3) The sample of each age level was representative of the entire target population in terms of the selected stratification variables (region and size of community).

(4) The size of the sample drawn at each age level was sufficiently large to allow for precise generalization to the performance of all 9-, 13-, and 17-year-olds in Connecticut and to the performance of selected sub-populations.

Because CAEP provided a local option, certain constraints had to be imposed on the sampling design which affected comparability with national (NAEP) data. The primary modification was that only those age-eligible students (as defined by NAEP) enrolled in the target grade for that age were selected for testing. That is, (1) those in the fourth grade born during calendar year 1967 (9-year-olds), (2) those in the eighth grade born during calendar year 1963 (13-year-olds), and (3) those in the eleventh grade born between October 1, 1959 and September 30, 1960, inclusive (17-year-olds). NAEP samples from all students born in the designated time periods regardless of current grade, while CAEP sampled only those age-eligible students in the target grades. Therefore, the "age" and "grade" terminologies may both be used appropriately for this assessment (bearing in mind that *not all* students of a given age or grade were eligible for testing). The age designation (e.g., 9-year-olds) is used in connection with statewide testing; the grade designation (e.g., fourth-graders) is used in connection with the Local Option.

General framework of the sampling plan. Two stratification variables were selected for the sampling plan: (1) region and (2) size of community. Categories of the region variable were based on the six Connecticut

Regional Educational Service Centers: (1) Regional Educational Services Concepts (through) Unified Effort (RESCUE), (2) Cooperative Educational Services, (3) Capital Region Education Council (CREC), (4) Area Cooperative Educational Services (ACES), (5) Project Learn, and (6) Northwest Area Regional Special Educational Services (N.A.R.S.E.S.). Table 1.4 describes in map form the division of the state into the six regions.

Categories of the size of community variable were defined as follows:

(1) "Big Cities"—towns of more than 100,000 population

(2) "Fringe Cities"—towns whose borders are contiguous with Big Cities and whose population exceeds 10,000

(3) "Medium Cities"—towns of more than 25,000 population which are not Big Cities or Fringe Cities

(4) "Smaller Places"—all other towns

According to this stratification, schools with similar characteristics could be grouped together and assigned to one of the 24 stratification categories which resulted from a crossing of the two variables. From each grouping (or cell), a proportional number of students could be sampled. Table 1.5 diagrams the framework of the sampling plan.

Sample size. The size of the sample of students to be tested was determined on the basis of (1) the level of precision desired in making generalizations from the performance of the sample to that of the student population as a whole and to that of the various stratified reporting groups, and (2) the size of the student population in the state at each

TABLE 1.4

Map of Connecticut Regional Educational Service Centers

CONNECTICUT REGIONAL EDUCATIONAL SERVICE CENTERS

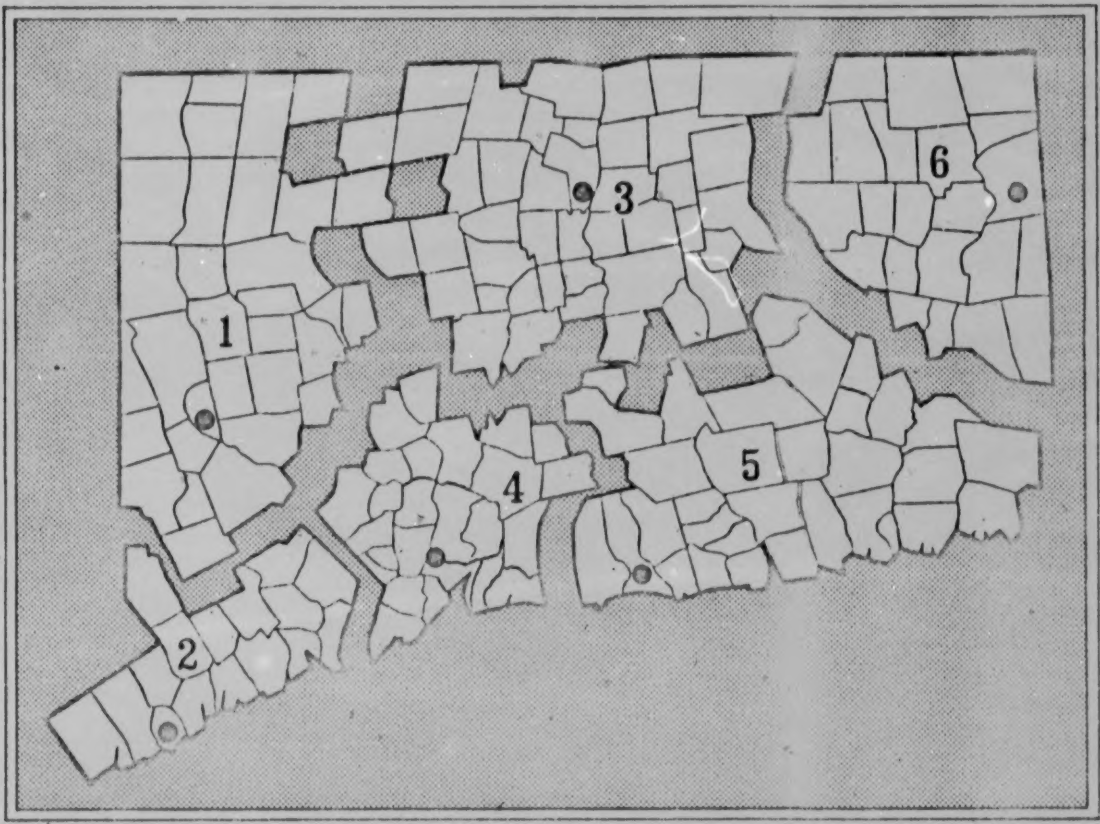


TABLE 1.5

Schematic Diagram of Sampling Strata

		Size of Community			
		Smaller Places	Medium Cities	Fringe Cities	Big Cities
Connecticut Regional Educational Service Centers	(1)				
	(2)				
	(3)				
	(4)				
	(5)				
	(6)				

age level and in each stratified reporting group. Whenever estimates are to be made about a population based on data collected from a sample, those estimates are subject to error. Error is the probable difference between the score of the sample and the true score of the population. Sampling precision refers to the maximum degree of error which will be tolerated in making such generalizations. Toleration of a sampling error of .2 (2 percentage points), for example, would mean the following: if, in a sample of 17-year-olds, an average of 80% of the items are answered correctly, the true score of the population probably lies between 78% and 82%.

The above probability statement is made in educational practice at a 95% confidence level. That is, in 95 out of every 100 samples, if the sample average score is 80% the true population average is expected to lie somewhere between 78% and 82%. For 5% of the samples which could be drawn, the true score will lie outside of this range. This level of confidence is generally considered sufficient for the purposes of educational research.

After consideration of these issues, the sample size for each age level was set at 2,880 students. This sample size was chosen to provide sufficient statistical precision for generalizing to the state and the desired reporting groups. The proportion of students sampled from each reporting category was made on the basis of the proportion of students in the population at the given age level. The formula for determining sample size follows:

$$n = \frac{N\sigma^2}{ND + \sigma^2}$$

where: N = number of students in population

$\sigma^2 = .25$

$\beta = \pm.02$ (error)

$D = \frac{\beta^2}{4} = .0001$

Sampling weights, ultimately computed and applied on the basis of the actual number of students who took the test, ensure that the average scores for the population and reporting groups are correctly estimated from the sample scores.

Implementation of the sampling plan. The implementation of the sampling design involved several steps:

Step 1: A sampling "frame," or list, of all eligible schools was constructed for each age level. Each school within the frame was assigned a region status and a community size status (see Table 1.5).

Step 2: The sampling frame at each age level was divided into separate frames for each stratified category, or cell, represented in Table 1.5. Thus, the frame for each age level was broken down into 24 separate lists (one for each cell).

Step 3: On a random basis, a proportional number of schools was selected from each of the 24 lists at each age level. The outcome of this step was a list of schools selected from each stratification category within each age level. If a school was randomly selected only once, only one test session was assigned to it. If the school was selected more than once, an additional test session was assigned to it for each additional selection.

Step 4A: (This step represents the second stage of the sampling procedure—the selection of students—as it was applied for schools participating in statewide testing *only*.) From rosters of all grade- and age-eligible students within each selected school, 24 students for each test administration assigned to the school were randomly selected.

Step 4B: An alternative method for selecting students was applied for schools participating in both the Local Option *and* statewide testing. In order to avoid double testing of these students, individual students were sampled *after* testing by drawing at random test booklets returned by the districts for processing (24 per assigned session). Only those students who were age-eligible (as reported on the student questionnaire) were eligible for selection.

(This method was used only where districts census-tested; where districts used the Local Option for only a *sample* of students, the procedure in Step 4A was used.)

In the implementation of the school sampling procedure, the number of students who could be selected from each eligible school was proportional to the size of the school. Larger schools could be selected more than once and consequently assigned more than one test administration. A total of 120 test administrations were assigned across all categories at each age level. Each test administration represented the testing of 24 students, for a total of 2,880 selected students at each age level. This provision allowed for an attrition of 17%, which was expected on the basis of previous educational assessments. It was therefore expected that, after attrition, assessment data would be available from approximately 2,390 students at each grade level. In fact, attrition was lower than expected at the 9- and 13-year-old levels, and only slightly higher than expected at the 17-year-old level.

Student participation. The number of students actually participating in testing at each age level and within each reporting category is shown in Table 1.6. The participation rate was 85% at the 9-year-old level, 95% at the 13-year-old level, and 82% at the 17-year-old level. The major causes for attrition were (1) student absence on the day of testing, (2) student withdrawal or transfer from the school, and (3) student failure to complete the test due to illness, etc. The sampling procedure

TABLE 1.6

Number of Students Tested at Each Age Level and in Each Reporting Group

Reporting Category*	Number of Students		
	9-Year-Olds	13-Year-Olds	17-Year-Olds
Region 1	319	323	357
Region 2	353	306	352
Region 3	562	552	485
Region 4	372	527	358
Region 5	281	301	329
Region 6	72	67	65
Big Cities	478	669	416
Fringe Cities	647	697	634
Medium Cities	638	688	658
Smaller Places	674	691	654

* The number of students participating from each *region* does not include students in "big cities."

protected the anonymity of all students, schools, and school districts participating in the assessment.

Implications for data analysis. Because it was known, based on previous Connecticut assessment information, that the scores of students in "Big Cities" tend to differ from those of students in the rest of a given region, it was decided that all data analyses (e.g., average test scores) would separate scores of "Big City" students from the respective region results.

Field Contact

Contact with school and district personnel, initiated in May and June of 1976, was designed to alert local personnel to the assessment and to provide detailed information on both the statewide and local phases of the assessment. Related activities included substantial contact with school and district personnel, both by mail and by telephone.

After initial contact with local personnel had been made by CSDE, NES mailed letters to the superintendents of every Connecticut school district describing both phases of the assessment, inviting them to participate in the Local Option, and enclosing sample result reports for the Local Option. NES sent follow-up mailings to those districts which did not respond in order to ensure that each district had received the information and had considered local participation in Phase 2. Close contact was maintained throughout the school year with those districts which chose to participate in order to provide direction and assistance as needed.

Following is a brief description of subsequent contact by NES staff at each age level with school and district personnel involved *only* in the statewide sample:

(1) A letter was mailed to superintendents of all school districts involved, outlining the schedule of events and listing by name those schools selected in their districts as well as the number of test administrations (consisting of 24 students per session) needed in each school.

(2) A letter was mailed to principals of all selected schools describing the assessment program, outlining scheduled principal responsibilities, indicating the number of test administrations assigned, and requesting the submission of a roster of all age-eligible students.

(3) Telephone calls were made to all participating principals to schedule appointments for testing sessions. The NES staff made every effort to accommodate the scheduling needs of individual schools.

(4) A letter was mailed to all participating principals providing the names of selected students for each testing session and confirming the dates and times of the scheduled testing appointments.

(5) A letter enclosing the principal questionnaire and requesting its completion was mailed to the principals of all schools containing statewide sample groups.

(6) A letter expressing thanks for their cooperation and participation was mailed to all superintendents and principals involved in the statewide sample.

NES staff made every effort to describe fully the aims and activities of the program, to describe with clarity the responsibilities of school personnel, and to foster cooperation with the program. Throughout the contact period, NES encouraged school personnel to call collect with any questions or concerns relative to the assessment.

Test Administration

To limit the burdens placed on school personnel, and to standardize administration procedures for the assessment, 13 persons from Connecticut with backgrounds in education were hired and trained by NES staff to conduct testing in the schools. Two regional test administrators' workshops were conducted by the NES staff for each age level of testing. At these workshops, test administrators were thoroughly trained with respect to (1) the research design of the assessment program, (2) school and student selection procedures, (3) test administration, (4) administration of the student questionnaires, (5) classroom procedures (including assembling of students, introducing the test, distribution and collection of materials, and handling of common and unusual situations), (6) special responsibilities (including advance telephone calls to principals to verify appointments; procedures for cancellation, postponement, or rescheduling of testing sessions; and handling of student rosters), and (7) field editing procedures. These procedures were described in detail in a test administrators' manual.

Tests were administered in October and November 1976 for 13-year-olds, in February 1977 for 9-year-olds, and in April 1977 for 17-year-olds. The test administration procedures were similar to those used by NAEP but did not include paced audiotapes accompanying the tests. Testing sessions began with a brief explanation of the purpose of the test, followed by the administration of the student questionnaires read aloud to students. When all students had completed the questionnaires, the directions for answering exercises were read aloud, and the students then proceeded to answer the test questions independently.

Following the testing session, test administrators performed a preliminary edit of testing materials and coded each response booklet with a district, school, and student identification number. At the close of each testing period, all materials were returned to NES for final editing, coding, and data processing.

Coding, Scoring, and Data Processing

All test booklets were subjected to an in-house edit at NES, including (1) a check on the coding of student, school, and district identification information; (2) a check on the completeness of the student questionnaire responses; and (3) an edit for stray marks and double responses to the multiple-choice questions.

Following the coding activities, NES staff hand-scored all responses to the open-ended exercises according to scoring guidelines provided by the National Assessment of Educational Progress. NAEP scoring categories for each open-ended item appear in Appendix A of this report immediately following the text of the respective item. The responses for each student were then keypunched and verified at the NES offices, and the cards were listed on a data tape for each age level.

The data tape for each age level contained one record for each student completing the test package. This record included: (1) information given by the student on the student questionnaire; (2) the student's responses to each of the exercises; (3) a numerical identification code which permitted the rematching of each student record to its original test document should that prove necessary; and (4) the responses on the matching school principal questionnaire and stratification information for the student's school, each matched to appropriate student records. Prior to data processing, the data tape was scanned for invalid entries and updated where necessary. All response data on the data tape were entered in raw score form and were converted to the percentage form as needed. Data reduction needs were determined and files were transformed where appropriate, including proper weighting of scores to provide estimates of the population from sample data. All student data (test scores and questionnaire data) were weighted; only principal questionnaire data remained unweighted [illegible]ce sampling was based on generalizing to students, not schools.

Data Analysis Plan

The basic elements of the analysis plan were decided upon jointly by NES and CSDE. The major purpose of the data analysis plan was to help to ensure that the assessment results and reports provided information which could be interpreted and utilized by Connecticut educators in determining critical needs and improving the educational system. The outcome of the analysis plan was a comprehensive description of the mathematics test performance of Connecticut 9-, 13-, and 17-year-olds. In addition, the analysis plan called for an in-depth report on the results of the student and principal questionnaire in terms of both the actual distribution of responses and the relationship of responses to student achievement.

The basic data generated for result reporting are given in percentages. These percentage scores include: (1) the average percentage of items answered correctly within each of the goal areas; (2) the average percent of the items answered correctly within each of the objectives matched to those goal areas; (3) the percentage of students scoring correctly on each of the exercises included on the tests; (4) the percentage of individuals selecting each choice on each item of the student and the school principal questionnaires; and (5) the percentage of students in the nation and in the Northeast region tested by NAEP answering each of the NAEP items correctly, provided for comparison purposes.

All of the Connecticut results, provided in the form described above, are provided in this report for each age level and for each reporting group selected by CSDE and the Advisory Committee. Where comparisons of performance are provided (for example, between a given reporting group and the statewide average), statistical tests were carried out to determine the significance of the difference.

Data Interpretation

Some of the data analyses conducted for this study involved tests of statistical significance on differences between scores of two separate groups of students. For example, Chapter 4, which compares the achievement of groups of students within Connecticut, and Chapter 5, which compares the achievement of Connecticut students with that of students across the nation, *both* include information on whether or not the difference in scores between respective groups was statistically significant. The reader must bear in mind that assertions of statistical significance are statements based on probability assumptions.

The percent correct reported for the state as a whole and for the individual reporting groups are estimates based on probability samples, and, as such, have standard errors associated with them. The reported differences in performance between a given group and the state average (effects) are also estimates and have associated standard errors. The standard error of an effect depends on the size of the two samples, the percent of each group answering the item correctly, and other stratification and clustering effects. Therefore, the magnitudes of the standard errors vary considerably from comparison to comparison. An effect that is twice the size of its associated standard error is considered to be significant at the .05 level.

The differences presented in this report are those which were statistically significant at the .05 level of confidence. In other words, a difference of the given magnitude could be expected to occur in repeated samplings only five times in 100 if, in fact, there were no differences between groups. While these results very likely reflect the actual performance differences between groups, they should not be used to infer the causes of these differences. For example, it may be shown that students who talk more frequently about school with their parents perform above the state average, but this does *not* imply that this activity *causes* higher performance.

It should be noted that some rather large effects are occasionally not statistically significant, while some rather small effects are in some instances significant. This is due to the fact that statistical significance is determined by the ratio of the effect to its standard error. For this reason, the reader should exercise caution in interpreting statistically significant differences. Statistical significance should not be equated with practical importance or educational meaningfulness. Just as acceptable levels of performance must be judged on the basis of educational expectations, the magnitude of differences observed between groups should similarly be judged not only on the basis of statistical significance but also on the basis of educational meaningfulness.

The reader should also be careful not to infer causality from the differences observed between the performance of Connecticut students and those in the nation and the Northeast region. The fact that Connecticut students surpassed the nation's or the Northeast region's students, or failed to perform as well, does not necessarily mean that Connecticut schools are causing the difference in performance. Community characteristics, family background, and personal characteristics of Connecticut students should be considered as bearing a relationship to performance results.

The variables used in reporting the results were selected by CSDE on the basis of their conceptual importance. That is, it was considered that these variables, should they prove to bear a relationship to student achievement in the area of mathematics, would contribute important information to state and local-level decision-makers in setting policy for the educational delivery system.

The Local Option

The Local Option phase of the assessment allowed participating districts to examine in detail the achievement of their own students in a single class or throughout the district by contracting directly with NES. Results permitted participating districts to (1) examine students, classes, schools, and the district as a whole; and (2) compare local achievement results with those in Connecticut, the nation, and the Northeast region. Materials, as well as regional workshops in test administration and interpretation, were provided by CSDE through NES. Districts absorbed the costs of data processing only, on a per capita basis.

The Local Option testing was conducted in the same time period as the statewide sample testing. Overlap of schedules facilitated the organization and execution of testing for both phases and eliminated many activities for those statewide sampled schools that elected to participate in the Local Option (see Step 4B, page 20).

The following services were provided by NES to those districts participating in the Local Option:

- training of test coordinators or administrators in test administration procedures at one of two regional workshops
- delivery and pick-up of test booklets
- editing and scoring of tests and data analysis
- complete result reports as described below
- assistance with interpretation of results at one of two regional workshops held after results had been returned to the districts

Two copies of each result report produced by NES were provided. The reports are listed below.

- For each class:
  - (1) a Student Objective Achievement Report
  - (2) a Class Item Analysis Report
  - (3) a Class Objective Summary Report
  - (4) a Class Questionnaire Report
- For each school:
  - (1) a School Item Analysis Report
  - (2) a School Objective Summary Report
  - (3) a School Questionnaire Report
- For the district:
  - (1) a District Item Analysis Report
  - (2) a District Objective Summary Report
  - (3) a District Questionnaire Report

Fifty-three Connecticut school districts participated in the Local Option at one or more grade levels. Overall, 8,851 fourth-grade students, 10,385 eighth-grade students, and 7,057 eleventh-grade students were tested. Each district received the reports listed above, and all were invited to attend one of two regional workshops on test interpretation. These workshops proved to be valuable, not only for interpretative issues but also as forums for discussion of usage of the results, presentations to local boards of education, and suggestions for improving the result reports. As one result, NES has added a fifth report to CAEP 1977-78's Local Option reporting, displaying the response each student gave to each question on the test. This report increases the diagnostic value of the testing.

NES made every effort to ensure that the special needs of individual school districts were met wherever possible. Schools participating in the Local Option may compare their own results with the results for the state and the respective groups as given in this report.

CHAPTER 2

ACHIEVEMENT RESULTS FOR ALL CONNECTICUT 9-, 13-, AND 17-YEAR-OLDS

The purpose of this chapter is to examine the test performance of Connecticut 9-, 13-, and 17-year-olds. The performance of each age group is described (1) for the goal areas of mathematics within each grade-level test, (2) for each of the objectives matched to the goal areas for each test, and (3) on each of the items matched to the objectives.

Data Analysis

The achievement results for each grade level will be described separately. Achievement results are described first for the goal areas and then by the objectives and their related test items. Performance within each goal area is given in terms of the average percentage of the matching test items that the students answered correctly. If, for example, students at a given age level show an average of 72% for a particular goal area, this means that on the average the students correctly answered 72% of the items assessing that goal area.

The data analysis for each objective parallels that for individual goal areas. The items for each objective are grouped together, and the average percentage of items answered correctly is presented.

In addition to results by goal area and objective, the percentage of students who answered correctly each item on the test is presented. Copies of the items appear in Appendix A of this report along with the percentage of students at each age level selecting each response choice.

All of the above results are described in narrative form in the text of this chapter. It is important to note that these results are by age level of students in the target grade for that particular age level. Thus the sampling included 9-year-old students in the fourth grade only, 13-year-old students in the eighth grade only, and 17-year-old students in the eleventh grade only.

All open-ended items were National Assessment of Educational Progress (NAEP) items and were scored according to NAEP guidelines. The scoring criteria for open-ended items appear in Appendix A along with the text of the item and the data on the distribution of responses. The NAEP scoring guidelines for student responses include one "acceptable" category and a number of "unacceptable" categories, each with several response possibilities. Appendix A presents the percentage of students who scored in each of these categories. Students who did not respond or whose responses were incomprehensible are not reported. For purposes of the present chapter, percentage-correct averages for goals and objectives containing open-ended items are computed using the percentage of students scored "acceptable" on these items.

Summary Tables for 9-, 13-, and 17-Year-Olds

Tables 2.1, 2.2, and 2.3 show, for each goal area, the average percentage of matching items answered correctly by all 9-, 13-, and 17-year-olds, respectively, and by males and females within each age group. Performance of males and females which is significantly different (at the .05 level of confidence) from the state average for all students is indicated by an asterisk to the right of the percentage value.

Tables 2.4, 2.5, and 2.6 show similar data for each objective. Again, statistically significant differences are indicated by asterisks to the right of the percentage values.

Interpretative Issues

When interpreting results from the tables, the reader should bear in mind that the scores of the 9-, 13-, and 17-year-olds for a given goal area or objective which they may share in common do not always reflect performance on the same set of items. Students in all three age groups received some items in common. However, while all three age groups were assessed on some of the same goal areas and objectives, each age group may have received different numbers of items or some entirely different items for a given goal area or objective. Some goal areas and objectives were not shared by all three age groups. The reader is referred to Chapter 3, "Comparing Age Groups Within Connecticut," for a description comparing achievement results across age groups.

TABLE 2.1

Average Percentage of Test Items Answered Correctly in Each Goal Area by All 9-Year-Olds and by Males and Females

Goal Area	9-Year-Olds		
	All	Males	Females
1. Mathematical Concepts	74.4	74.8	74.1
2. Computation	78.6	76.7*	80.4*
3. Measurement	81.7	83.5*	80.1*
4. Applications/Problems	54.6	56.0*	53.3*
5. Charts and Graphs	78.4	79.8*	77.1*
TOTAL TEST	74.3	74.8	74.0

* Represents significant difference from score of all students in the age group.

TABLE 2.2

Average Percentage of Test Items Answered Correctly
in Each Goal Area by All 13-Year-Olds
and by Males and Females

Goal Area	13-Year-Olds		
	All	Males	Females
1. Mathematical Concepts	61.2	64.6*	58.4*
2. Computation	80.1	79.9	80.2
3. Measurement	72.2	77.2*	68.0*
4. Charts and Graphs	89.1	89.4	88 .9
5. Applications/Problems	66.9	70.4*	64.0*
6. Geometry	78.9	81.4*	76.7*
TOTAL TEST	74.8	76.7*	73.1*

* Represents significant difference from score of all students in the age group.

TABLE 2.3

Average Percentage of Test Items Answered Correctly in Each Goal Area by All 17-Year-Olds and by Males and Females

Goal Area	17-Year-Olds		
	All	Males	Females
1. Mathematical Concepts	68.4	74.4*	63.8*
2. Computation	82.4	82.7	82.2
3. Measurement	80.4	85.9*	76.2*
4. Charts and Graphs	93.2	93.8*	92.8*
5. Applications/Problems	66.7	71.7*	63.0*
6. Geometry	48.7	55.4*	43.7*
TOTAL TEST	76.9	79.9*	74.6*

* Represents significant difference from score of all students in the age group.

TABLE 2.4

Average Percentage of Test Items Answered Correctly in Each Objective by All 9-Year-Olds and by Males and Females

Goal/Objective	9-Year-Olds		
	All	Males	Females
MATHEMATICAL CONCEPTS:			
1. The student demonstrates an understanding of place value for whole numbers.	79.3	80.3	78.3
2. The student demonstrates an understanding of ordering of whole numbers.	77.7	79.1*	76.5*
3. The student demonstrates an understanding of fractional notation.	66.4	65.1	67.5
COMPUTATION:			
4. The student demonstrates the ability to add whole numbers.	81.5	80.0*	82.8*
5. The student demonstrates the ability to subtract whole numbers.	73.5	71.5*	75.3*
6. The student demonstrates the ability to multiply whole numbers.	81.0	78.6*	83.0*

* Represents significant difference from score of all students in the age group.

TABLE 2.4 (continued)

Goal/Objective	9-Year-Olds		
	All	Males	Females
MEASUREMENT:			
7. The student demonstrates the ability to convert U.S. units of currency to larger or smaller units.	83.4	85.2*	81.7*
8. The student demonstrates the ability to identify and compute time from a clock face.	74.8	77.2*	72.7*
9. The student demonstrates a working knowledge of linear units of measure.	87.0	88.2*	85.9*
APPLICATIONS/PROBLEMS:			
10. The student demonstrates the ability to solve word problems involving mathematical skills.	54.4	55.0	54.0
11. The student demonstrates the ability to solve word problems involving real world situations.	54.7	57.1*	52.6*
CHARTS AND GRAPHS:			
12. The student demonstrates the ability to interpret data from charts and graphs.	78.4	79.8*	77.1*

TABLE 2.5

Average Percentage of Test Items Answered Correctly in Each Objective by All 13-Year-Olds and by Males and Females

Goal/Objective	13-Year-Olds		
	All	Males	Females
MATHEMATICAL CONCEPTS:			
1. The student demonstrates an understanding of rational numbers in the form of fractions and decimals	61.5	63.1*	60.1*
2. The student demonstrates an understanding of ordering of decimals, fractions, and whole numbers.	60.5	65.5*	56.2*
COMPUTATION:			
3. The student demonstrates the ability to add and subtract whole numbers.	92.8	92.6	93.1
4. The student demonstrates the ability to multiply whole numbers.	89.9	88.7*	91.0*
5. The student demonstrates the ability to divide whole numbers.	84.8	84.3	85.2
6. The student demonstrates the ability to add and subtract decimals.	81.0	81.6	80.5
7. The student demonstrates the ability to multiply decimals.	75.3	74.6	76.0
8. The student demonstrates the ability to add and subtract fractions and mixed numbers.	62.7	62.8	62.6
9. The student demonstrates the ability to multiply fractions and mixed numbers.	74.1	75.2*	73.3*

* Represents significant difference from score of all students in the age group.

TABLE 2.5 (continued)

Goal/Objective	13-Year-Olds		
	All	Males	Females
MEASUREMENT:			
10. The student demonstrates a working knowledge of area and perimeter.	65.7	68.9*	62.9*
11. The student demonstrates the ability to convert a U.S. unit of measure to larger or smaller units.	77.0	82.5*	72.4*
12. The student demonstrates knowledge of metric units of measure.	73.9	80.2*	68.6*
CHARTS AND GRAPHS:			
13. The student demonstrates the ability to interpret data from charts and graphs.	89.1	89.4	88.9
APPLICATIONS/PROBLEMS:			
14. The student demonstrates the ability to solve word problems involving mathematical skills.	62.6	65.5*	60.2*
15. The student demonstrates the ability to solve word problems involving real world situations.	71.2	75.2*	67.9*
GEOMETRY:			
16. The student demonstrates knowledge of basic geometric concepts.	78.9	81.4*	76.7*

TABLE 2.6

Average Percentage of Test Items Answered Correctly
in Each Objective by All 17-Year-Olds
and by Males and Females

Goal/Objective	17-Year-Olds		
	All	Males	Females
MATHEMATICAL CONCEPTS:			
1. The student demonstrates an understanding of rational numbers in the form of fractions and decimals.	68.5	71.3*	66.4*
2. The student demonstrates an understanding of ordering of decimals, fractions, and whole numbers.	67.8	77.2*	60.8*
COMPUTATION:			
3. The student demonstrates the ability to add and subtract whole numbers.	94.9	94.5	95.2
4. The student demonstrates the ability to multiply whole numbers.	91.6	90.7*	92.3*
5. The student demonstrates the ability to divide whole numbers.	87.6	88.1	87.3
6. The student demonstrates the ability to add and subtract decimals.	88.9	88.5	89.2
7. The student demonstrates the ability to multiply and divide decimals.	72.3	72.0	72.5
8. The student demonstrates the ability to add and subtract fractions and mixed numbers.	69.4	72.2*	67.3*
9. The student demonstrates the ability to multiply and divide fractions and mixed numbers.	72.3	73.2	71.6

* Represents significant difference from score of all students in the age group.

TABLE 2.6 (continued)

Goal/Objective	17-Year-Olds		
	All	Males	Females
MEASUREMENT:			
10. The student demonstrates a working knowledge of area, perimeter, and volume.	73.0	79.0*	68.4*
11. The student demonstrates the ability to convert a U.S. unit of measure to larger or smaller units.	85.9	89.9*	82.8*
12. The student demonstrates knowledge of metric units of measure.	82.2	88.8*	77.1*
CHARTS AND GRAPHS:			
13. The student demonstrates the ability to interpret data from charts and graphs.	93.2	93.8*	92.8*
APPLICATIONS/PROBLEMS:			
14. The student demonstrates the ability to solve word problems involving mathematical skills.	70.9	76.3*	66.8*
15. The student demonstrates the ability to solve word problems involving real world situations.	62.1	66.8*	58.6*
GEOMETRY:			
16. The student demonstrates the ability to solve problems involving basic geometric concepts.	48.7	55.4*	43.7*

When interpreting differences in scores between males and females, statistical significance should not necessarily be the deciding factor. Since, given a large sample size, very small differences may prove to be statistically significant, the actual magnitude of the differences between percentages should be considered for purposes of determining educational meaningfulness.

Finally, the reader should exercise caution in making inferences about goal-level and objective-level achievement. The objectives selected for each goal area are not necessarily representative of all the objectives that could have been selected. The same is true for the items selected for each objective. Therefore, inferences should be made conditional upon the content of the four or five items used to measure each objective. Items selected represent the collective opinion of the Connecticut Mathematics Advisory Committee about the appropriateness of the items in terms of their match to their respective objectives and about the usefulness of the items as measures of valuable mathematics skills in their own right.

Achievement Results for 9-Year-Olds

Results for each of the three age levels will be described for goal area, objective within goal area, and item. The test for the 9-year-olds consisted of 60 test items, measuring six goal areas and a total of 16 objectives. Each objective was measured by five test items. Seven of the 60 test items were open-ended; the rest were multiple-choice in format. Each of the tables in this section presents the results for the items and objectives by goal area.

I. Mathematical Concepts. There were three objectives for this goal area, containing a total of 15 test items. On the average, 9-year-olds correctly answered 74.4% of all items in the goal area. Table 2.7 displays the results for the three objectives and 15 test items in the goal area.

II. Computation. There were three objectives and 15 test items for this goal area. On the average, 9-year-olds correctly answered 78.6% of all items in the goal area. Table 2.8 contains the results for the three objectives and 15 test items.

III. Measurement. There were three objectives and 15 test items for this goal area. On the average, 9-year-olds correctly answered 81.7% of all items in the goal area. Table 2.9 contains the results for the three objectives and 15 items.

IV. Applications/Problems. There were two objectives and 10 test items for this goal area. On the average, 9-year-olds correctly answered 54.6% of all items in the goal area. Table 2.10 contains the results for the two objectives and 10 items.

Item 12 for Objective 11, which required students to determine how much fencing was necessary for a garden 9 feet by 5 feet, was answered correctly by only 8.3% of the 9-year-olds. Forty-three percent added 9 and 5, and 31.8% multiplied 9 by 5.

TABLE 2.7

Average Percentage Correct by Objective and Test Item for the Goal Area of Mathematical Concepts for 9-Year-Olds

Item Position on Test	Description of Item	Average Percentage Correct
Objective 1:	The student demonstrates an understanding of place value for whole numbers.	79.3
8.	Identify digit in tens place	79.1
14.	Place values in 762	80.9
25.	Sum of hundreds, tens, ones	78.4
43.	Place value of 7 in 7000	77.7
55.	Value of 4 in 3654	80.1
Objective 2:	The student demonstrates an understanding of ordering of whole numbers	77.7
4.	Which is greatest (4-digit numbers ending in 00)	87.4
10.	Which is greatest (5-digit numbers)	64.7
15.	Which number is least (whole numbers)	83.2
42.	Next number after 98, 99, 100,	94.6
58.	Number 10 more than 4375	58.8
Objective 3:	The student demonstrates an understanding of fractional notation.	66.4
2.	Fractional part of rectangle shaded ($\frac{1}{4}$)	60.7
27.	Fractional part of circle shaded ($\frac{1}{6}$)	63.2
36.	Fraction of dots colored in ($\frac{2}{7}$)	73.4
41.	Fractional part of circle shaded ($\frac{2}{5}$)	71.7
52.	Fractional part of rectangle shaded ($\frac{1}{8}$)	62.9

TABLE 2.8

Average Percentage Correct by Objective and Test Item for the Goal Area of Computation for 9-Year-Olds

Item Position on Test	Description of Item	Average Percentage Correct
Objective 4:	The student demonstrates the ability to add whole numbers.	81.5
20.*	38 + 19 =	88.8
22.*	$3.06 + 10.00 + 9.14 + 5.10 =	48.4
32.	826 + 786 =	86.6
53.	634 + 41 + 5122 =	90.9
59.	725 + 203 =	92.8
Objective 5:	The student demonstrates the ability to subtract whole numbers.	73.5
13.*	1054 - 865 =	50.9
21.*	36 - 19 =	77.3
29.	659 - 207 =	88.4
45.	476 - 38 =	76.1
56.	861 - 583 =	74.7
Objective 6:	The student demonstrates the ability to multiply whole numbers.	81.0
3.	4613 x 5 =	78.3
11.	402 x 7 =	67.5
31.	36 x 3 =	80.8
34.	312 x 4 =	89.2
40.	63 x 3 =	89.0

* Open-ended item

TABLE 2.9

Average Percentage Correct by Objective and Test Item for the Goal Area of Measurement for 9-Year-Olds

Item Position on Test	Description of Item	Average Percentage Correct
Objective 7:	The student demonstrates the ability to convert U.S. units of currency to larger or smaller units.	83.4
5.	A quarter equals how many nickels	91.9
16.	A nickel equals how many pennies	95.0
44.	A half-dollar equals how many dimes	64.4
49.	Twenty pennies equals how many nickels	78.9
60.	A dollar equals how many quarters	86.6
Objective 8:	The student demonstrates the ability to identify and compute time from a clock face.	74.8
6.	Time shown on clock (7:55)	58.5
24.	Time shown on clock (10 to 4)	75.6
47.	Time shown on clock (6:25)	83.0
51.	Time it was two hours ago	67.7
57.	Time it will be in one-half hour	89.4
Objective 9:	The student demonstrates a working knowledge of linear units of measure.	87.0
7.	Estimate height of girl in fourth grade	68.4
26.	Best unit to measure between two cities	94.7
30.	Best unit to measure toothbrush	86.9
33.	Length of pencil to nearest inch	92.6
48.	Length of nail to nearest centimeter	92.4

TABLE 2.10

Average Percentage Correct by Objective and Test Item for the Goal Area of Applications/Problems for 9-Year-Olds

Item Position on Test	Description of Item	Average Percentage Correct
Objective 10:	The student demonstrates the ability to solve word problems involving mathematical skills.	54.5
1.	At rate of 5 minutes per window, how could one figure how many minutes to wash 10 windows	61.1
19.	Rocket aimed at target 525 miles south, landed 624 miles south. Missed target by how many miles	39.4
23.*	At 2 biscuits per day, how long until dog eats 24 biscuits	50.7
46.	Amount of change from $5 for a $1.40 purchase	39.1
54.	Total of 8 apples, 17 apples, and 37 apples	81.7
Objective 11:	The student demonstrates the ability to solve word problems involving real world situations.	54.7
9.	At $2 per shirt, how much would 7 shirts cost	85.2
12.*	Feet of fencing to enclose garden 9 feet long, 5 feet wide	8.3
28.	Figure which has the same area as figure shown (all rectangles)	53.9
35.	From 4:25 to 5:00 P.M. is how many minutes	45.0
50.	Two nickels, 1 quarter, and 4 pennies equals how much money	81.4

* Open-ended item

V. Charts and Graphs. There was one objective and five test items for this goal area. On the average, 9-year-olds correctly answered 78.4% of all items in the goal area. Table 2.11 contains the results for the objective and items.

TABLE 2.11

Average Percentage Correct by Objective and Test Item for the Goal Area of Charts and Graphs for 9-Year-Olds

Item Position on Test	Description of Item	Average Percentage Correct
Objective 12:	The student demonstrates the ability to interpret data from charts and graphs.	78.4
17.	Pictograph—on which day did most people use the library (symbol=20 people)	94.8
18.	Pictograph—how many people used library on specific day (symbol=20 people)	37.6
37.	Bar graph—who weighs most	95.5
38.	Bar graph—who weighs closest to 50 pounds	69.6
39.	Bar graph—who weighs least	94.4

Achievement Results for 13-Year-Olds

The test for the 13-year-olds consisted of 66 test items which measured seven goal areas with 16 objectives. Fourteen objectives were measured by four test items each, and two objectives were measured by five items each. Seventeen of the 66 items were open-ended, and the rest were multiple-choice items. The results of the tests are presented by goal area, with the results by objectives and items presented in tables by goal area.

I. Mathematical Concepts. There were two objectives for this goal area, having a total of eight test items. On the average, 13-year-olds correctly answered 61.2% of all items in the goal area. Table 2.12 contains the results for the two objectives and eight items of the goal area.

II. Computation. There were seven objectives for this goal area, having a total of 28 test items. On the average, 13-year-olds correctly answered 80.1% of all items in the goal area. Table 2.13 contains the results for the seven objectives and 28 items of the goal area.

III. Measurement. There were three objectives and 12 test items for this goal area. On the average, 13-year-olds correctly answered 72.2% of all items in the goal area. Table 2.14 contains the results for the three objectives and 12 items of the goal area.

IV. Charts and Graphs. There was one objective with four test items to measure this goal area. On the average, 13-year-olds correctly answered 89.1% of all items in the goal area. Table 2.15 contains the results for the one objective and four items of the goal area.

V. Applications/Problems. There were two objectives and 10 test items for this goal area. On the average, 13-year-olds correctly answered

TABLE 2.12

Average Percentage Correct by Objective and Test Item for the Goal Area of Mathematical Concepts for 13-Year-Olds

Item Position on Test	Description of Item	Average Percentage Correct
Objective 1:	The student demonstrates an understanding of rational numbers in the form of fractions and decimals.	61.5
5.	13 boys and 15 girls in a group; what fractional part is boys	32.4
6.	.009 is equivalent to what fraction	69.7
18.	Fractional part of circle shaded	93.1
25.*	1/5 is equivalent to what percent	54.5
Objective 2:	The student demonstrates an understanding of ordering of decimals, fractions, and whole numbers.	60.5
7.	Which number is least (whole numbers)	97.9
14.	Fraction that is greatest	30.0
19.	Number that is greatest (decimals)	85.5
66.	Ordering fractions	31.8

* Open-ended item

TABLE 2.13

Average Percentage Correct by Objective and Test Item for the Goal Area of Computation for 13-Year-Olds

Item Position on Test	Description of Item	Average Percentage Correct
Objective 3:	The student demonstrates the ability to add and subtract whole numbers.	92.8
3.*	38 + 19 =	95.6
8.	826 + 786 =	96.8
9.*	36 - 19 =	83.1
12.*	1054 - 865 =	86.8
Objective 4:	The student demonstrates the ability to multiply whole numbers.	89.9
1.*	38 x 9 =	86.7
16.	46 x 50 =	94.7
20.	74 x 38 =	88.9
32.	609 x 73 =	91.3
Objective 5:	The student demonstrates the ability to divide whole numbers.	84.8
15.	714 ÷ 7 =	73.6
21.	$8.96 ÷ 4 =	90.9
27.*	125 ÷ 5 =	93.5
60.	339 ÷ 22 =	83.5
Objective 6:	The student demonstrates the ability to add and subtract decimals.	81.0
17.	0.6 + 8 + .24 =	82.7
24.*	$3.06 + 10.00 + 9.14 + 5.10 =	88.1
50.*	If 23.8 is subtracted from 62.1	72.3
61.	$10.00 - 1.98 =	85.1

* Open-ended item

TABLE 2.13 (continued)

Item Position on Test	Description of Item	Average Percentage Correct
Objective 7:	The student demonstrates the ability to multiply decimals.	75.3
29.	4.2 x 0.3 =	70.3
36.	425 x 0.33 =	86.0
42.	$1.98 x 4 =	92.2
43.	$1.29 x 0.06 =	56.9
Objective 8:	The student demonstrates the ability to add and subtract fractions and mixed numbers.	62.7
22.	$\frac{1}{2} + \frac{1}{3} =$	59.6
35.	$4\frac{1}{2} - 2\frac{1}{4} =$	80.4
59.	$\frac{5}{6} - \frac{1}{3} =$	53.4
63.	$2\frac{3}{8} + 3\frac{7}{8} =$	63.8
Objective 9:	The student demonstrates the ability to multiply fractions and mixed numbers.	74.1
34.	$\frac{1}{2} \times \frac{1}{4} =$	79.5
38.	$\frac{2}{3} \times \frac{3}{4} =$	78.8
47.	$4\frac{1}{2} \times 3 =$	68.3
56.	$\frac{3}{8} \times 2 =$	73.0

TABLE 2.14

Average Percentage Correct by Objective and Test Item for the Goal Area of Measurement for 13-Year-Olds

Item Position on Test	Description of Item	Average Percentage Correct
Objective 10:	The student demonstrates a working knowledge of area and perimeter.	65.7
23.*	Feet of fencing to enclose garden 9 feet long and 5 feet wide	44.8
33.	Area of rectangle shown (6 inches by 2 inches)	55.7
55.	Perimeter of triangle shown (17 cm by 24 cm by 32 cm)	81.7
57.	Figure which has same area as figure shown (all rectangles)	84.1
Objective 11:	The student demonstrates the ability to convert a U.S. unit of measure to larger or smaller units.	77.0
2.	30 inches = __ feet __ inches	86.3
40.	2 hours 20 minutes = __ minutes	92.5
49.*	1½ pounds = __ ounces	57.5
62.	8 quarts = __ gallons	76.2
Objective 12:	The student demonstrates knowledge of metric units of measure.	73.9
31.	Metric unit used to measure distance between two cities	72.9
37.	Metric unit used to measure page of test	76.9
44.	Smallest metric unit of measurement	68.1
58.	Gram is used to measure (weight)	85.0

* Open-ended item

TABLE 2.15

Average Percentage Correct by Objective and Test Item for the Goal Area of Charts and Graphs for 13-Year-Olds

Item Position on Test	Description of Item	Average Percentage Correct
Objective 13:	The student demonstrates the ability to interpret data from charts and graphs.	89.1
41.	Reading a circle graph	87.4
46.	Reading a table of sock sizes	88.1
53.	Reading a chart with symbol for kind of unit	92.5
65.*	Reading a bar graph	91.6

* Open-ended item

66.9% of all items in the goal area. Table 2.16 contains the results for the two objectives and 10 items of the goal area.

TABLE 2.16

Average Percentage Correct by Objective and Test Item for the Goal Area of Application/Problems for 13-Year-Olds

Item Position on Test	Description of Item	Average Percentage Correct
Objective 14:	The student demonstrates the ability to solve word problems involving mathematical skills.	62.6
10.*	Several people received votes; what percentage of total vote did one of the people receive	27.2
26.*	Person left for work at 7:45 A.M., returned home 10 hours later at what time	79.7
48.*	Mary took four tests and received four different numbers of items correct; how many items were incorrect	76.4
51.*	Three people earned money; what was average amount earned	55.7
52.*	Rocket aimed at target missed target by how many miles	81.3
Objective 15:	The student demonstrates the ability to solve word problems involving real world situations.	71.2
11.*	At 10% and 15% discounts, what is the difference in prices for TV set regularly priced at $100	60.9
28.	Distance on map is 3 inches; at scale of 1 inch = 45 miles, what is actual distance between cities	95.1
30.	Sales tax of 3 cents on a dollar, what is tax on a $10 purchase	94.5
54.	At average speed of 50 MPH, how many hours to travel 275 miles	50.6
64.	Sales tax of 6%, what is tax on $200 TV set	59.9

* Open-ended item

VI. Geometry. There was one objective and four test items for this goal area. On the average, 13-year-olds correctly answered 78.9% of all items in the goal area. Table 2.17 contains the results for the one objective and four items of the goal area.

TABLE 2.17

Average Percentage Correct by Objective and Test Item for the Goal Area of Geometry for 13-Year-Olds

Item Position on Test	Description of Item	Average Percentage Correct
Objective 16:	The student demonstrates knowledge of basic geometric concepts.	78.9
4.	Picture of parallel lines	94.2
13.	Line segment in a circle which is the diameter	73.5
39.	Kind of angle found in a square	70.5
45.	Shape most like an orange (sphere)	82.5

Achievement Results for 17-Year-Olds

The test for the 17-year-olds consisted of 64 test items which measured six goal areas with 16 objectives. All objectives were measured by four items each. Nineteen of the 64 items were open-ended; the rest were multiple-choice items. The results of the tests are presented by goal area with the results by objectives and items presented in tables by goal area (see Tables 2.18 through 2.23).

I. Mathematical Concepts. There were two objectives for this goal area, having a total of eight test items. On the average, 17-year-olds correctly answered 68.4% of all test items in the goal area. Table 2.18 contains the results for the two objectives and eight items of the goal area.

II. Computation. There were seven objectives for this goal area, having a total of 28 test items. On the average, 17-year-olds correctly answered 82.4% of all items in the goal area. Table 2.19 contains the results for the seven objectives and 28 items of the goal area.

III. Measurement. There were three objectives for this goal area, having a total of 12 test items. On the average, 17-year-olds correctly answered 80.4% of all items in the goal area. Table 2.20 contains the results for the three objectives and 12 items of the goal area.

IV. Charts and Graphs. There was one objective for this goal area, having a total of four test items. On the average, 17-year-olds correctly answered 93.2% of all items in the goal area. Table 2.21 contains the results for the objective and four test items of the goal area.

V. Applications/Problems. There were two objectives and eight test items for this goal area. On the average, 17-year-olds correctly answered 66.7% of all items in the goal area. Table 2.22 contains the results for the two objectives and eight items of the goal area.

TABLE 2.18

Average Percentage Correct by Objective and Test Item for the Goal Area of Mathematical Concepts for 17-Year-Olds

Item Position on Test	Description of Item	Average Percentage Correct
Objective 1:	The student demonstrates an understanding of rational numbers in the form of fractions and decimals.	68.5
7.*	1/5 is equivalent of what percent	63.0
9.	Fraction describing shaded portion of figure	86.0
35.	.009 is equivalent to what fraction	73.5
62.	13 boys and 15 girls in a group; what fractional part is boys	51.5
Objective 2:	The student demonstrates an understanding of ordering of decimals and fractions.	67.8
22.	Ordering fractions	56.5
49.	Number that is greatest (decimals)	92.6
53.	Number that is smallest (decimals)	76.9
59.	Fraction that is greatest	45.4

* Open-ended item

TABLE 2.19

Average Percentage Correct by Objective and Test Item for the Goal Area of Computation for 17-Year-Olds

Item Position on Test	Description of Item	Average Percentage Correct
Objective 3:	The student demonstrates the ability to add and subtract whole numbers.	94.9
6.*	38 + 19 =	97.0
14.*	36 - 19 =	95.0
26.*	1054 - 865 =	92.3
28.	826 + 786 =	95.2
Objective 4:	The student demonstrates the ability to multiply whole numbers.	91.6
4.*	38 x 9 =	88.0
20.	609 x 73 =	95.0
52.	74 x 38 =	88.5
55.	46 x 50 =	95.0
Objective 5:	The student demonstrates the ability to divide whole numbers.	87.6
1.	714 ÷ 7 =	77.2
10.	339 ÷ 22 =	90.9
17.*	125 ÷ 5 =	94.7
36.	$74.46 ÷ 17 =	87.7
Objective 6:	The student demonstrates the ability to add and subtract decimals.	88.9
3.	0.6 + 8 + .24 =	87.0
15.*	$3.06 + 10.00 + 9.14 + 5.10 =	94.0
24.*	If 23.8 is subtracted from 62.1	84.4
37.	$10.00 - 1.98 =	90.2

* Open-ended item

TABLE 2.19 (continued)

Item Position on Test	Description of Item	Average Percentage Correct
Objective 7:	The student demonstrates the ability to multiply and divide decimals.	72.3
38.	$1.29 x 0.06 =	71.1
45.	425 x 0.33 =	87.7
47.	1.96 ÷ 0.4 =	70.5
51.	17 ÷ 0.25 =	59.8
Objective 8:	The student demonstrates the ability to add and subtract fractions and mixed numbers.	69.4
2.	$4\frac{1}{4} - 2\frac{1}{2} =$	63.5
46.	$\frac{5}{6} - \frac{1}{3} =$	66.1
56.	$2\frac{3}{8} + 3\frac{7}{8} =$	76.4
61.	$\frac{1}{2} + \frac{1}{3} =$	71.7
Objective 9:	The student demonstrates the ability to multiply and divide fractions and mixed numbers.	72.3
32.	$4\frac{1}{2} \times 3 =$	80.4
34.	$\frac{1}{2} \times \frac{1}{4} =$	84.7
54.	$\frac{3}{8} \div 2 =$	65.6
63.	$3 \div \frac{3}{4} =$	58.4

TABLE 2.20

Average Percentage Correct by Objective and Test Item for the Goal Area of Measurement for 17-Year-Olds

Item Position on Test	Description of Item	Average Percentage Correct
Objective 10:	The student demonstrates a working knowledge of area, perimeter, and volume.	73.0
12.	One gallon of paint covers 250 square feet; how many gallons are needed to cover a wall 48 feet by 10 feet	70.4
25.*	Feet of fencing to enclose garden 9 feet long and 5 feet wide	58.8
29.	Given formula for area of triangle, find area of triangle with $b = 4$ and $h = 10$	87.9
44.	Find volume of box	74.7
Objective 11:	The student demonstrates the ability to convert a U.S. unit of measure to larger or smaller units.	85.9
18.	8 quarts = __ gallons	83.7
33.	30 inches = __ feet __ inches	92.0
40.*	1½ pounds = __ ounces	74.2
64.	2 hours 20 minutes = __ minutes	93.7
Objective 12:	The student demonstrates knowledge of metric units of measure.	82.2
19.	Metric unit used to measure distance between two cities	76.5
31.	Gram is used to measure (weight)	93.4
48.	Metric unit used to measure capacity of gasoline tank	85.7
57.	Smallest metric unit of measurement	73.1

* Open-ended item

TABLE 2.21

Average Percentage Correct by Objective and Test Item for the Goal Area of Charts and Graphs for 17-Year-Olds

Item Position on Test	Description of Item	Average Percentage Correct
Objective 13:	The student demonstrates the ability to interpret data from charts and graphs.	93.2
11.	Reading a table of sock sizes	93.7
13.*	Reading a bar graph	90.8
21.	Reading a circle graph	95.5
50.	Reading a line graph	93.0

* Open-ended item

TABLE 2.22

Average Percentage Correct by Objective and Test Item for the Goal Area of Applications/Problems for 17-Year-Olds

Item Position on Test	Description of Item	Average Percentage Correct
Objective 14:	The student demonstrates the ability to solve word problems involving mathematical skills.	70.9
8.*	Several people received votes; what percentage of total vote did one of the people receive	45.7
16.*	Three people earned money; what was the average amount earned	72.3
27.*	If 300 calories in 9 ounces of food, how many calories in 3 ounces of the food	79.1
43.*	Person left for work at 7:45 A.M., returned home 10 hours later at what time	86.5
Objective 15:	The student demonstrates the ability to solve word problems involving real world situations	62.1
30.	Sales tax of 6%, what is tax on $200 TV set	79.7
39.*	How much more would a person pay to buy a certain car on credit than by paying cash	56.9
41.*	Parking lot charges 35¢ first hour, 25¢ each additional hour or fraction; what is the cost to park from 10:45 A.M. to 3:05 P.M.	54.3
58.	At average speed of 50 MPH, how many hours to travel 275 miles	57.5

* Open-ended item

VI. Geometry. There was one objective for the goal area, having a total of four test items. On the average, 17-year-olds correctly answered 48.7% of all items in the goal area. Table 2.23 contains the results for the objective and four items of the goal area.

TABLE 2.23

Average Percentage Correct by Objective and Test Item for the Goal Area of Geometry for 17-Year-Olds

Item Position on Test	Description of Item	Average Percentage Correct
Objective 16:	The student demonstrates the ability to solve problems involving basic geometric concepts.	48.7
5.*	Degrees of angle formed by hands of clock at 3 o'clock	71.7
23.*	Height of tent pole (use of right triangle)	39.0
42.*	Degrees of third angle of a triangle	51.8
60.	Estimate circumference of circle given the diameter	32.3

* Open-ended item

Summary

Table 2.24 displays in graphic form a summary of achievement on each goal area by each age level. Tables 2.25 through 2.27 display summaries of achievement on each objective for each age level, respectively.

TABLE 2.24

Graph of Achievement on Goal Areas by Age Group

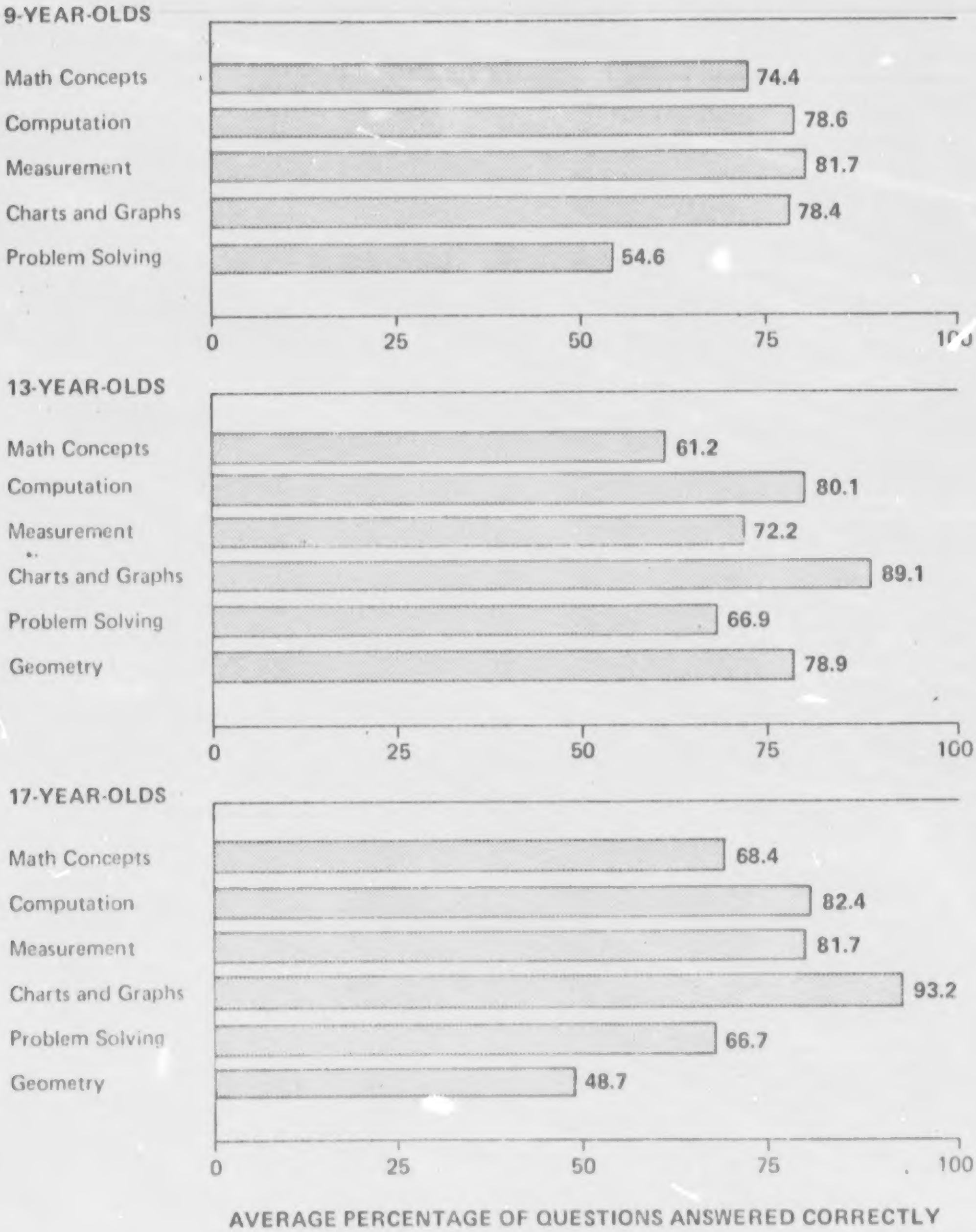


TABLE 2.25

Graph of Achievement on Objectives: 9-Year-Olds

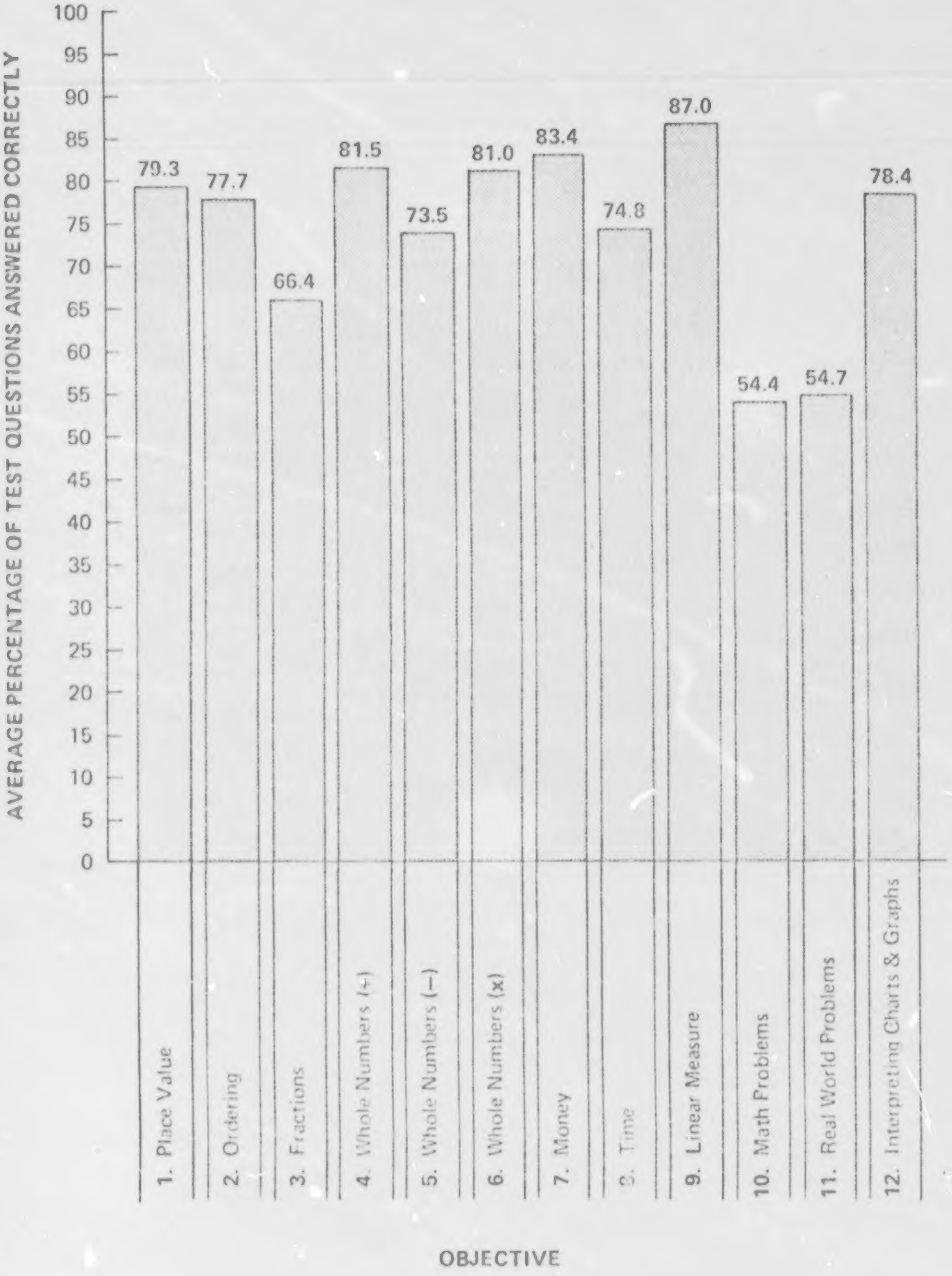


TABLE 2.26

Graph of Achievement on Objectives: 13-Year-Olds

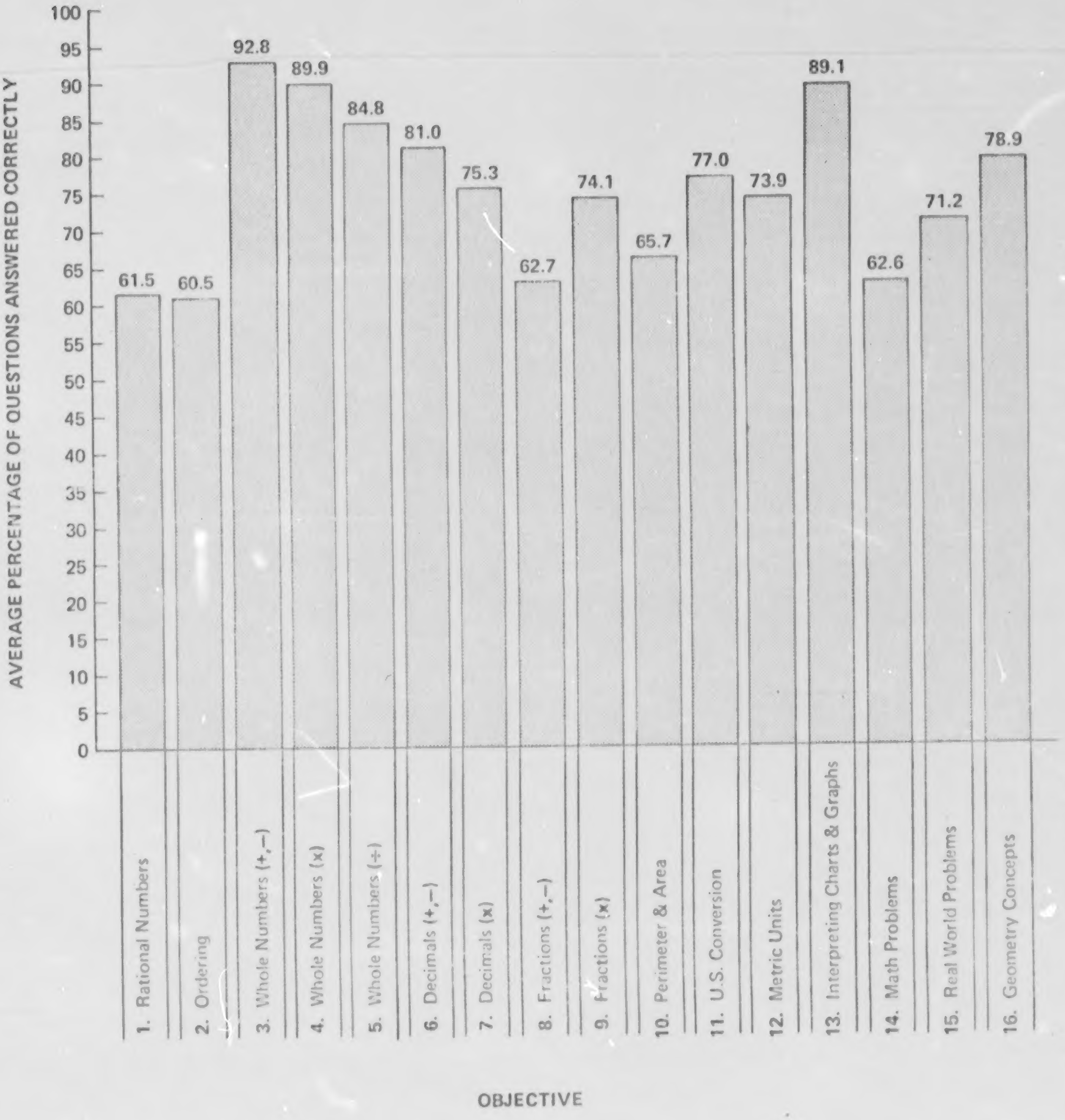
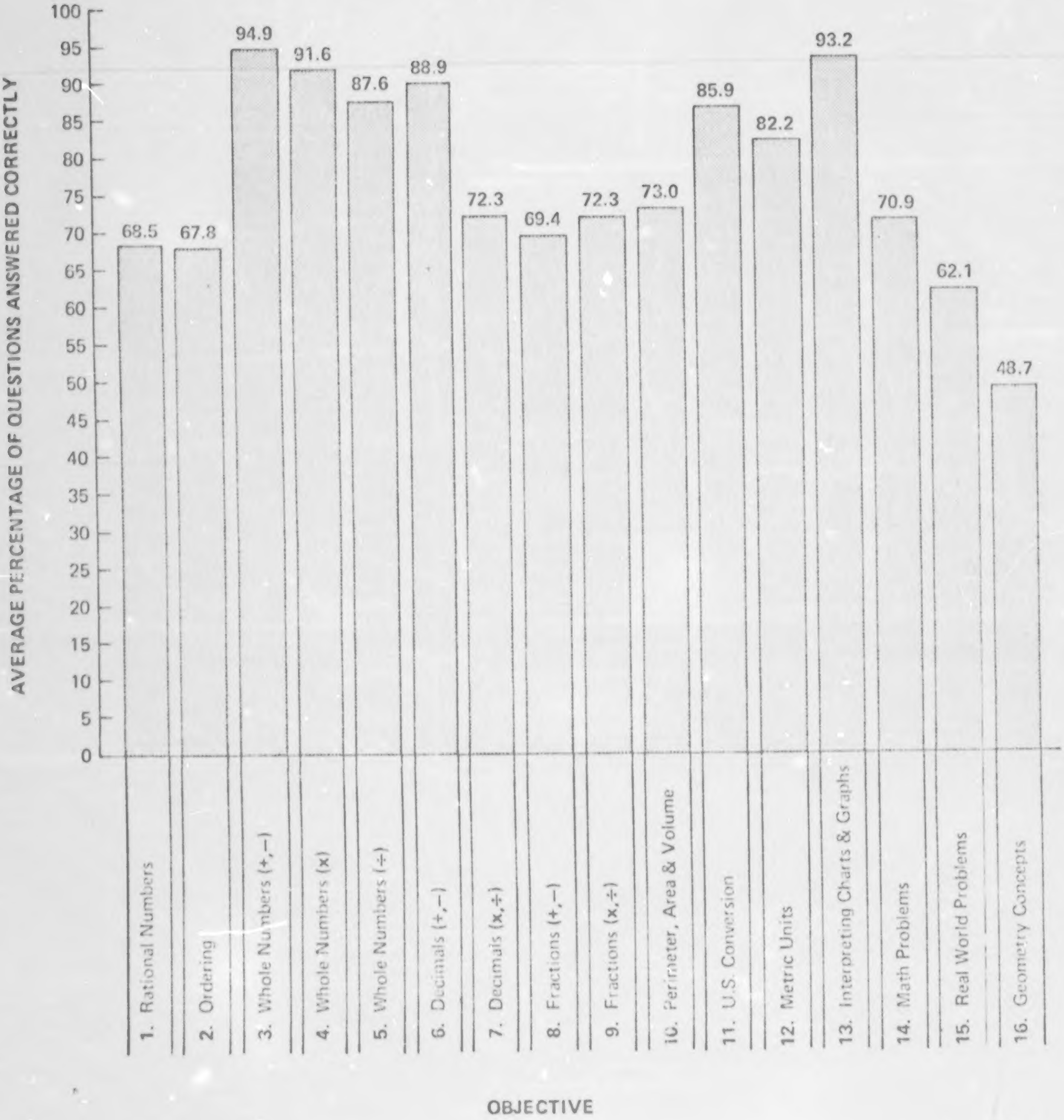


TABLE 2.27

Graph of Achievement on Objectives: 17-Year-Olds



Goal area achievement. Nine-year-olds scored quite highly on four of the five goal areas, answering correctly an average of over 74% of the matching test items in the goal areas of Mathematical Concepts, Computation, Measurement, and Charts and Graphs. Lowest performance by 9-year-olds was in the goal area of Problem Solving (54.5% correct).

Performance of 13-year-olds was more variable across the objectives. Their achievement ranged from a high of 89.1% correct on Charts and Graphs to a low of 61.2% on Mathematical Concepts.

The widest range in achievement across goal areas was displayed by 17-year-olds, who scored above 90% on one goal area (Charts and Graphs), just above 80% on two goal areas (Computation and Measurement), 66-68% on two other goal areas (Mathematical Concepts and Problem Solving), and as low as 48% on Geometry.

Achievement on objectives. Nine-year-olds scored an average of over 80% correct on four of the 12 objectives assessed at their level (Adding Whole Numbers, Multiplying Whole Numbers, Money, and Linear Measure). Lowest performance was on Math Problems and Real World Problems (both 54% correct) and Fractions (66%). On all other objectives, 9-year-olds scored in the 73-79% range.

Thirteen-year-olds scored an average of around 90% correct on three of the 16 objectives assessed at that age level (Multiplying Whole Numbers, Adding and Subtracting Whole Numbers, and Interpreting Charts and Graphs). On five other objectives, performance was in the 60-65% range (Rational Numbers, Ordering, Adding and Subtracting Fractions, Perimeter and Area, and Math Problems). On the remaining eight objectives, 13-year-olds scored in the 71-85% range.

Seventeen-year-olds performed most highly on the same three objectives on which 13-year-old performance was highest: Adding and Subtracting Whole Numbers (95%), Multiplying Whole Numbers (91%), and Interpreting Charts and Graphs (93%). By contrast, however, the performance of 17-year-olds was lowest on the Geometry Concepts objective (about 49%). The items for this objective, however, were more complex at the 17-year-old level. These students scored in the 82-89% range on four other objectives (Dividing Whole Numbers, Adding and Subtracting Decimals, U.S. Conversion, and Metric exercises). They scored in the 62-73% range on the remaining eight objectives.

The 17-year-olds performed better than the 13-year-olds, and the 13-year-olds performed better than the 9-year-olds on items which were identical for each pair of age groups. Generally, the difference between the performance of 9- and 13-year-olds was greater than the difference between the performance of 13- and 17-year-olds.

CHAPTER 3

COMPARING AGE GROUPS WITHIN CONNECTICUT

Introduction

The purpose of this chapter is to compare the performance of Connecticut students on test items on which 9-, 13-, and/or 17-year-old students were tested in common. When the identical test item was used on two or on all three tests, this chapter presents the comparison results.

The use of the same item for more than one age level permits a comparison to determine the extent to which students of different age levels differ in achievement. In such comparisons it is hoped that achievement increases as the age level increases. A decrease in achievement provides information useful for instructional planning, since it is one indication that a mathematics skill or knowledge judged important by Connecticut educators is not uniformly retained or reinforced across the school years.

Achievement Results Across Age Groups

The items appearing on more than one test are summarized by item position on the tests in Tables 3.1 through 3.8. Each table covers one goal area. Objectives to which the items are referenced are not included, because in some instances an item was referenced to one objective on one test and to another objective on another test. For example, the item: "What fractional part of the figure below is shaded?" was referenced for 9-year-olds to Objective 3: "The student demonstrates an understanding of fractional notation," while for 13-year-olds it was referenced to Objective 1: "The student demonstrates an understanding of rational numbers." Since the intent of the test developers was to focus on individual items for comparison purposes across tests, comparison by objective will not be made.

Goal area: Mathematical Concepts. Table 3.1 contains a description of the items which appeared on tests for two or all three age groups for the goal area of Mathematical Concepts.

As was expected, 13-year-old students performed better than 9-year-old students on the two items which the tests had in common. Seventeen-year-old students also performed better than 13-year-olds. Of interest to the reader is the magnitude of the differences in performance and the nature of the item content. Differences between the 9- and 13-year-olds were dramatic. The difference between the 13- and 17-year-olds appeared to be less dramatic. This result is also to be expected, since most of the items' content would have been taught either during or after fourth grade and, thus, some of the content would be new for many fourth-graders; however, all of the content supposedly would be review work for the 13- and 17-year-olds and, thus, the expectation might be that these two age groups would tend to perform somewhat similarly on elementary school mathematics content.

The reader should note that for the three items referencing fractions only, which both 13- and 17-year-olds had in common, only about a third

TABLE 3.1

Comparison of Achievement across Age Groups on Shared Items for the Goal Area of Mathematical Concepts

Item Number			Description of Item	Percentage of Students Scoring Correctly		
9	13	17		9	13	17
41	18		Fractional part of figure shaded (circle)	71.7	93.1	
	5	62	13 boys and 15 girls in a group, what fractional part of group is boys?		32.4	51.5
	25	7	$\frac{1}{5}$ is equivalent to what percent?		54.5	63.0
	6	35	.009 is equivalent to what fraction?		69.7	73.5
	19	49	Which number is greatest? (decimals)		85.5	92.6
	14	59	Which fraction is greatest?		30.0	45.4
15	7		Which number is least? (whole numbers)	83.2	97.9	
	66	22	Ordering fractions		31.8	56.5

(30.0% t0 32.4%) of the 13-year-olds and about half (45.4% to 56.5%) of the 17-year-olds answered the item correctly.

Goal area: Computation. Tables 3.2 and 3.3 contains descriptions of the items which were shared by tests of two or all three age groups for the goal area of Computation.

As was expected, 13- and 17-year-old students performed better than 9-year-olds on items assessing computation with whole numbers (see Table 3.2). The range in percentages of students scoring correctly for 9-year-olds on the *four* items in common was 50.9% to 88.8%, whereas the range was smaller for the other two age groups on their *11* common items (73.6% to 96.8% for 13-year-olds and 77.2% to 97.0% for 17-year-olds).

On the 11 items in common for the 13- and 17-year-olds on computation with whole numbers, both age groups performed very similarly; 17-year-olds, on the average, performed only slightly better than the 13-year-olds. In summary, both the 13- and 17-year-olds achieved high percentages correct on these 11 items.

Table 3.3 displays performance on computation items for decimals and fractions. Only one item on computation with decimals and fractions (see Table 3.3) was shared by all three age groups. It required students to add four decimals. Only 48.4% of the 9-year-olds correctly answered the item, whereas 83.1% of the 13-year-olds and 94.0% of the 17-year-olds correctly answered it. On the six items shared by the 13- and 17-year-olds for computation of decimals, 17-year-olds performed better than 13-year-olds by an average of seven percentage points per item (with a range of two to

TABLE 3.2

Comparison of Achievement across Age Groups on Shared Items for the Goal Area of Computation (Whole Numbers)

Item Number			Description of Item	Percentage of Students Scoring Correctly		
9	13	17		9	13	17
20	3	6	38 + 19 =	88.8	95.6	97.0
21	9	14	36 - 19 =	77.3	93.1	95.0
32	8	28	826 + 786 =	86.6	96.8	95.2
13	12	26	1,054 - 865 =	50.9	86.8	92.3
	1	4	38 x 9 =		86.7	88.0
	16	55	46 x 50 =		94.7	95.0
	20	52	74 x 38 =		88.9	88.5
	32	20	609 x 73 =		91.3	95.0
	27	17	125 ÷ 5 =		93.5	94.7
	15	1	714 ÷ 7 =		73.6	77.2
	60	10	339 ÷ 22 =		83.5	90.9

TABLE 3.3

Comparison of Achievement across Age Groups on Shared Items for the Goal Area of Computation (Decimals and Fractions)

Item Number			Description of Item	Percentage of Students Scoring Correctly		
9	13	17		9	13	17
22	24	15	\$3.06 + 10.00 + 9.14 + 5.10 =	48.4	88.1	94.0
	61	37	\$10.00 - 1.98 =		85.1	90.2
	17	3	0.6 + 8 + .24 =		82.7	87.0
	50	24	If 23.8 is subtracted from 62.1		72.3	84.4
	36	45	425 x 0.33 =		86.0	87.7
	43	38	\$1.29 x 0.06 =		56.9	71.1
	22	61	$\frac{1}{2} + \frac{1}{3} =$		59.6	71.7
	63	56	$2\frac{3}{8} + 3\frac{7}{8} =$		63.8	76.4
	59	46	$\frac{5}{6} - \frac{1}{3} =$		53.4	66.1
	47	32	$4\frac{1}{2} \times 3 =$		68.2	80.4
	34	34	$\frac{1}{2} \times \frac{1}{4} =$		79.5	84.7

14 percentage points).

The difference in performance between the 13- and 17-year-olds on the five items for computation of fractions was very marked. The 17-year-olds performed better by an average of nearly 11 percentage points per item (with a range of five to 13 percentage points).

Goal area: Measurement. Table 3.4 contains a description of the items which appeared on tests for two or all three age groups for the goal area of Measurement.

As has been the case with all of the goal areas thus far, each succeeding age group performed better than the one before it. Of special interest is the first test item described in Table 3.4. This was an open-ended item that read as follows:

> Mr. Simmons put a wire fence all the way around his rectangular garden. The garden is 9 feet long and 5 feet wide. How many feet of fencing did he use?

Students who answered the item incorrectly generally either multiplied 9 by 5 or added 9 and 5. Table 3.5 shows the results for the three age groups for the item.

From Table 3.5, the reader should note that there were large differences between age groups in terms of the percentage of students correctly answering the item and in terms of not adding 9 and 5 to get an incorrect response. However, there was a consistent trend for all three age groups to multiply 9 by 5, arriving at an incorrect response.

Returning to Table 3.4, the reader can readily see that only two

TABLE 3.4

Comparison of Achievement across Age Groups on Shared Items for the Goal Area of Measurement

Item Number			Description of Item	Percentage of Students Scoring Correctly		
9	13	17		9	13	17
12*	23	25	Feet of fencing needed to enclose rectangular garden 9 feet long and 5 feet wide	8.3	44.8	58.8
28*	57		Which figure has same area as figure shown above (all rectangles)	53.9	84.1	
	49	40	1½ pounds = __ ounces		57.9	74.2
	62	18	8 quarts = __ gallons		76.2	83.7
	40	64	2 hours 20 minutes = __ minutes		92.5	93.7
	2	33	30 inches = __ feet __ inches		86.3	92.0
	31	19	Unit of measure for distance between two cities (metric)		72.9	76.5
	44	57	Smallest unit (metric)		68.1	73.1
	58	31	Gram measures (weight)		85.0	93.4

* Item listed under goal area of problem solving for 9-year-olds.

TABLE 3.5

Student Performance on the Mr. Simmons
Item Appearing on All Three Tests

Response	Percentage Giving Response		
	9-Year-Olds	13-Year-Olds	17-Year-Olds
Correct Answer: 28	8.3	44.8	58.8
45 (9 x 5)	31.8	26.9	25.3
14 (9 + 5)	43.0	16.2	7.3

measurement items were administered to both the 9- and 13-year-olds, and 13-year-olds performed much better on both items. On the eight items in common for both 13- and 17-year-olds, the 17-year-olds performed better on each item and did so by an average of nearly eight percentage points per item.

Goal area: Problem Solving. Table 3.6 contains a description of the items that were administered to more than one age group in the goal area of Problem Solving. The 17-year-olds clearly performed better than the 13-year-olds on the five items common to these age groups, with an average of nearly 14 percentage points between the groups. The 13-year-olds averaged only 54.6% correct, compared to the 17-year-olds, who averaged 68.3% correct. The smallest difference was 7% and the largest 20%. On the one item shared by 9- and 13-year-olds, 13-year-olds performed better than 9-year-olds, with more than twice as many (81.3% versus 39.4%) correctly

TABLE 3.6

Comparison of Achievement Across Age Groups on Shared Items for the Goal Area of Problem Solving

Item Number			Description of Item	Percentage of Students Scoring Correctly		
9	13	17		9	13	17
	51	16	T earned $205, C earned $562, D earned $400. What is the average?		55.7	72.3
	10	8	J received 120 votes, M received 50, G received 30. What percent of total votes did J receive?		27.2	45.7
	26	43	Arrived at job at 7:45 A.M., returned home 10 hours later. What time did person arrive home?		79.6	86.5
	54	58	At 50 MPH, how many hours to go 45 miles?		50.5	57.5
	64	30	Sales tax rate is 6%. What is tax on $200 television set?		59.9	79.7
19	52		A rocket was directed at a target 525 miles south of the launching point. It landed 624 miles south of the launching point. By how many miles did it miss its target?		39.4	81.3

answering the item (a difference of 42 percentage points).

One item was included in the goal area of Problem Solving for 9-year-olds, but matched to the goal area of Measurement for 13- and 17-year-olds. Results across age levels are displayed separately in Table 3.5, along with an indication of the percentage of students selecting incorrect responses. A much larger percentage of 13- and 17-year-olds could compute the perimeter of Mr. Simmons' garden (45% and 59%, respectively) than could 9-year-olds (8%). The pattern of incorrect response choice varied in that the most common wrong answer given by 9-year-olds was 14 (9 + 5), while the most common incorrect response by 13- and 17-year-olds was 45 (9 x 5).

Goal area: Charts and Graphs. Table 3.7 contains a description of the items which were shared by tests of the 13- and 17-year-old age groups for the goal area of Charts and Graphs. No items assessing this skill for 9-year-olds were used on tests for the 13- and 17-year-olds.

Both 13- and 17-year-olds showed high achievement on the three items, with 13-year-olds performing slightly better than the 17-year-olds on one of the three items.

Summary

The 17-year-olds performed better than the 13-year-olds, and the 13-year-olds performed better than the 9-year-olds on items which were identical for each pair of age groups. Generally, the difference between the performance of 9- and 13-year-olds was greater than the difference between the performance of 13- and 17-year-olds.

TABLE 3.7

Comparison of Achievement Across Age Groups on Shared Items for the Goal Area of Charts and Graphs

Item Number			Description of Item	Percentage of Students Scoring Correctly		
9	13	17		9	13	17
	65	73	Bar graph showing number of trees planted for five-day period. Question: How many trees planted on certain day?		91.6	90.8
	46	11	Table of sock sizes for particular shoe sizes. Question: If wear particular shoe size, what is sock size?		88.1	93.7
	41	21	Reading a circle graph for smallest portion		87.4	95.5

CHAPTER 4

COMPARING THE ACHIEVEMENT OF CONNECTICUT REPORTING GROUPS

Introduction

The purpose of this chapter is to describe and compare the mathematics achievement of selected groups of students within Connecticut. Each of the selected groups is defined on the basis of responses to the principal and student questionnaires. A total of 12 questions from the student questionnaire and seven from the principal questionnaire were selected to define reporting groups, although some of these questions are not applicable to all three age groups assessed.

In the case of student questionnaire items, students were separated into groups based on their responses to the questions, and the average for achievement was computed for each group. For principal questionnaire items, students were grouped in terms of the responses given by their respective principals, and the average achievement was computed for the student group. In each case, the average for the reporting group is compared to that for *all* students at that age level within Connecticut (the state average). The purpose of these analyses was to identify those characteristics of students and their schools that bear a relationship to student achievement.

Achievement is defined in most cases as performance on the total test, that is the average percentage of all items on the test answered correctly by students in a given group. However, for three of the variables (sex of student, size of community, and region of the state) differences in achievement are also described on the basis of goal area and objective scores. These more detailed analyses were performed on only these three variables. The latter two variables were obtained not from the questionnaires but from the sampling stratification of the schools. It should be noted that all results by region of the state are given exclusive of big cities (see p. 20).

The results for Connecticut reporting groups are described in narrative form. The discussion highlights all of the major differences between groups. The reader is referred to Appendix B for a display of all data for all reporting groups in tabular form.

The results described in this chapter are organized by age level. Results are presented first for all reporting groups at the 9-year-old level, then for 13-year-olds, and, lastly, for 17-year-olds. A concluding summary provides an overview of results for all age groups on each variable.

The differences between groups described in the chapter are those that were statistically significant at the .05 level of confidence. The reader is referred to the section on "data interpretation" in Chapter 1 for cautionary statements regarding inferences drawn from these results. Small differences between groups may be *statistically significant*; however, they may be too small to be educationally meaningful. The reader is directed to consider the magnitude of the differences in scores between groups to determine educational meaningfulness.

Comparing 9-Year-Old Reporting Groups

Sex of student. At the 9-year-old level, there was no significant difference from the state on total test score for either male or female students.

On goal area scores, males scored significantly above and females scored significantly below the state on three goal areas—Goal Area 3 (Measurement), Goal Area 4 (Problem Solving), and Goal Area 5 (Charts and Graphs). Females scored significantly above and males scored significantly below the state in Goal Area 2 (Computation), and no significant difference from the state was found for either group in Goal Area 1 (Mathematical Concepts). The largest difference above the state across goal areas and reporting groups was found in Goal Area 3 (Measurement), with males scoring 1.8% above the state. The largest difference below the state was found in Goal Area 2 (Computation), with males scoring 1.9% below the state.

No significant differences from the state for either males or females were found on Objective 1 (Understanding of Place Value for Whole Numbers), Objective 3 (Understanding of Fractional Notation), and Objective 10 (Math Skills Word Problems). Females performed significantly above the state and males performed significantly below the state on Objective 4 (Ability to Add Whole Numbers), Objective 5 (Ability to Subtract Whole Numbers), and Objective 6 (Ability to Multiply Whole Numbers). Males performed significantly above and females performed significantly below the state on the other six objectives. The largest difference above the state across objectives and reporting groups was found on Objective 11 (Real World Word

Problems), with males 2.4% above the state. The largest difference below the state across objectives and reporting groups was found on Objective 6 (Ability to Multiply Whole Numbers), with males scoring 2.3% below the state.

Size of community. Test scores were grouped according to the size of the student's community: big city, fringe city, medium city, or smaller community. Significant differences from the state on total test score were found for each reporting group except the medium cities. Big cities scored 12.2% below the state, fringe cities scored 2.6% above the state, and smaller communities scored 4.0% above the state.

In every goal area, the big cities scored significantly below the state, with the largest difference (14.7% below the state) occurring in Goal Area 1 (Mathematical Concepts) and the smallest difference (10.0% below the state) occurring in Goal Area 2 (Computation). The medium cities were not significantly different from the state in any goal area. The fringe cities were significantly above the state in every goal area except Goal Area 5 (Charts and Graphs) where no significant difference was found. The smaller communities scored significantly above the state in every goal area, with the largest difference (4.9% above the state) occurring in Goal Area 5 and the smallest difference (3.4% above the state) occurring in Goal Area 2 (Computation). The magnitude of the difference between the small communities and the state exceeded the magnitude of the difference between the fringe cities and the state in every goal area.

The big cities scored significantly below the state in all twelve objectives, with the largest difference (17.3% below the state) occurring on Objective 1 (Understanding of Place Value for Whole Numbers) and the smallest difference (7.9% below the state) occurring on Objective 6 (Ability to Multiply Whole Numbers). The medium cities showed no significant difference from the state on any objective except Objective 7 (Ability to Convert U.S. Units of Currency) where they were 2.2% above the state. The fringe cities were significantly above the state on eight of the objectives but showed no significant differences from the state on Objective 3 (Understanding of Fractional Notation), Objective 4 (Ability to Add Whole Numbers), Objective 8 (Ability to Compute Time), and Objective 12 (Ability to Interpret Charts and Graphs). Of the objectives for which significant differences were found, the greatest magnitude for the fringe cities (4.1% above the state) was observed on Objective 6 (Ability to Multiple Whole Numbers), and the smallest significant difference (1.9% above the state) was found on Objective 9 (Knowledge of Linear Units of Measure). Smaller communities were significantly above the state on all objectives, with the largest difference (5.3% above the state) occurring on Objective 8 (Ability to Compute Time) and Objective 10 (Math Skills Word Problems) and the smallest difference (2.1% above the state) occurring on Objective 11 (Real World Word Problems).

Region of state. Test scores were grouped according to region of the state: Region 1—RESCUE, Region 2—Cooperative Educational Services, Region 3—CREC, Region 4—ACES, Region 5—Project Learn, and Region 6—N.A.R.S.E.S. The "big cities," however, were *excluded* from their respective regions. Significant differences from the state on total test score were found in

Region 2 (5.1% above the state), Region 5 (4.0% above the state), and Region 3 (2.8% above the state). No significant differences from the state on total test score were observed in the remaining three regions.

Region 2 scored significantly above the state in all goal areas, with the largest difference (6.6% above the state) occurring in Goal Area 4 (Problem Solving) and the smallest difference (2.9% above the state) occurring in Goal Area 5 (Charts and Graphs). Region 5 scored above the state in every goal area except Goal Area 1 (Mathematical Concepts), with the largest significant difference (5.0% above the state) occurring in Goal Area 5 (Charts and Graphs) and the smallest significant difference (3.6% above the state) occurring in Goal Area 4. Region 3 scored significantly above the state in every goal area except Goal Area 2 (Computation), with the largest difference (4.0% above the state) found in Goal Area 1 (Mathematical Concepts) and the smallest significant difference (2.8% above the state) found in Goal Area 4. Region 1 scored significantly above the state (2.7%) only on Goal Area 5 (Charts and Graphs) and showed no significant differences from the state in any other goal area. Region 4 and Region 6 showed no significant differences from the state in any goal area.

Region 2 scored significantly above the state on all 12 objectives, with the largest difference (10.0% above the state) found on Objective 3 (Understanding of Fractional Notation) and the smallest difference (2.9% above the state) found on Objective 12 (Ability to Interpret Charts and Graphs). Region 3 scored significantly above the state on every objective except Objective 3, Objective 6 (Ability to Multiply Whole Numbers), and

Objective 9 (Knowledge of Linear Units of Measure). Among those objectives for which significant differences were found, the largest difference for Region 3 (5.4% above the state) was found on Objective 1 (Understanding of Place Value for Whole Numbers), and the smallest significant difference (1.9% above the state) was found on Objective 11 (Real World Word Problems). Region 5 scored significantly above the state on every objective except Objective 2 (Understanding of Ordering of Whole Numbers), Objective 3, Objective 5 (Ability to Subtract Whole Numbers), and Objective 11. Among the objectives for which significant differences were found, the largest difference for Region 5 (7.2% above the state) was found on Objective 6, and the smallest significant difference (3.7% above the state) was found on Objective 9 (knowledge of Linear Units of Measure). Region 1 scored significantly above the state on Objectives 1, 2, 5, and 12, with the largest difference (4.2% above the state) occurring on Objective 5 and the smallest significant difference (2.7% above the state) occurring on Objective 12. Region 1 was not significantly different from the state on the other eight objectives. Region 4 scored significantly above the state on Objective 2 (2.1% above) and Objective 9 (2.5% above) and showed no significant differences from the state on any other objective. Region 6 scored significantly below the state on Objective 6 (11.8% below) and showed no significant differences from the state on any other objective.

Socioeconomic status. Total test scores were grouped according to three levels of socioeconomic status—high, medium, and low—based on a ratio of people to rooms in the home obtained from student questionnaires.

Significant differences from the state on total test score were found for each reporting group, with performance improving as socioeconomic status improved. Specifically, the low socioeconomic status group was 5.6% below the state, the medium socioeconomic-status group was 2.3% above the state, and the high socioeconomic-status group was 5.2% above the state.

Parental discussion of school. Students were asked whether they talked to their parents about school "daily," "weekly," "monthly," or "hardly ever." Significant differences from the state on total test score were observed in the "hardly ever" group, which was 5.2% below the state, and in the "weekly" group, which was 3.8% above the state. No significant differences from the state were found in the other two reporting groups.

Parental assistance with schoolwork. Students were asked whether or not their parents helped them with the schoolwork. Significant differences from the state on total test score were observed for both reporting groups, with students reporting parental assistance scoring 1.1% *below* the state and students reporting no assistance scoring 2.9% *above* the state.

Television watching. Students were asked how many hours of television they watched each day. Responses were "less than one hour," "between one and two hours," "between two and three hours," "between three and four hours," and "more than four hours." Significant differences from the state on total test score were found for every reporting group. Performance relative to the state improved as television watching increased up to the two to three hour limit and then declined with further increments of time spent watching. Specifically, those who watched less than one hour daily scored 6.7% below the state, the "one to two hour" group scored 2.2% above the state, the "two to three hour" group scored 4.4% above the state, the "three to four hour" group scored 2.1% above the state, and the "more than four hours" group scored 2.7% below the state.

Attitude toward school. Students were asked how much they liked school. Responses were "I hate it," "I don't like it," "It's O.K.," "I like it," and "I like it a lot." Significant differences from the state on total test score were observed in the "I hate it," "I like it," and "I like it a lot" groups. Performance relative to the state improved as attitude toward school became more positive up to the most positive response, where performance relative to the state declined. Specifically, those who hate school scored 4.4% below the state, those who like it scored 4.9% above the state, but those who like it "a lot" scored 2.1% *below* the state.

Attitude toward mathematics. Students were asked whether they liked mathematics "very much," "somewhat," or "not at all." Significant differences from the state on total test score were observed for every reporting group except those reporting that they like mathematics "very much." Those who reported that they did not like mathematics at all scored 4.8% below the state, whereas those who like mathematics "somewhat" scored 1.4% above the state.

Perceived utility of mathematics compared to other subjects. Students were asked whether, in comparison to other subjects they studied in school, they found mathematics "very useful," "somewhat useful," or "not very useful." Significant differences from the state on total test score were found for every reporting group except those who reported that they found mathematics "very useful." Those who find mathematics "not very useful" scored 7.2% below the state, whereas those who find mathematics "somewhat useful" scored 1.7% above the state.

Availability of consultants or specialists. Scores were grouped according to whether a student's principal reported that consultants or specialists worked with mathematics teachers in the schools. Significant differences from the state on total test score were observed for both reporting groups, with students whose principals reported that consultants or specialists *were* available scoring 3.1% *below* the state and students whose principals reported that consultants or specialists were *not* available scoring 1.5% *above* the state. This seemingly anomalous result may be explained by the fact that consultants or specialists tended to be more available in the big cities (see Chapter 7: Results of the Principal Questionnaire) and that the "big city" 9-year-olds scored considerably below the state on total test score (see above).

Achievement level organization of classroom. Scores were grouped according to whether a student's principal reported that the predominate form of classroom organization in the school was according to achievement level or irrespective of achievement level. No significant differences from the state were observed for either reporting group.

Type of mathematics instruction. Scores were grouped according to whether a student's principal reported that the typical mathematics classroom utilized traditional teacher-centered activities or individualized instruction. No significant differences from the state on total test score were found for the teacher-centered group, whereas the individualized instruction group scored 2.7% below the state. Again, this particular group effect may be due to the fact that individualized instruction tended to prevail in the "big cities" rather than in other areas.

Curriculum or program development. Scores were grouped according to whether or not a student's principal reported that major curriculum or program development in mathematics had taken place in the school in the last five years. No significant differences from the state on total test score were found for either reporting group.

Class size. Scores were grouped according to whether or not a student's principal reported that mathematics teachers in the school felt that class sizes were too large. Significant differences from the state were observed for both reporting groups, with students from schools with reportedly over-sized classes scoring 5.3% below the state and students from schools with reportedly non-over-sized classes scoring 1.8% above the state.

Comparing 13-Year-Old Reporting Groups

Sex of student. At the 13-year-old level, results on total test score for both males and females were statistically significant in comparison to the state. The average for males was 1.9% above the state, and the average for females was 1.7% below the state.

The trend across goal areas paralleled the results on total test score in four of the six goal areas. The greatest significant differences consistent with the trend on total test score were found in Goal Area 3 (Measurement), with males scoring 5.0% above the state and females scoring 4.3% below the state. The smallest significant differences consistent with the total test score trend were found in Goal Area 6 (Geometry), with males 2.5% above the state and females 2.1% below the state. The exceptions to the total test score trend were found in Goal Area 2 (Computation) and Goal Area 4 (Charts and Graphs), for which there were no significant differences from the state average for either males or females for either goal.

The results on objective scores paralleled the results on total test score for nine of the 16 objectives. The largest differences consistent with the total test trend were found on Objective 12 (Knowledge of Metric Units of Measure), with males 6.3% above the state and females 5.4% below the state. The smallest significant differences consistent with the total test trend were found on Objective 9 (Ability to Multiply and Divide Fractions and Mixed Numbers), with males 1.0% above the state and females 0.9% below the state. On objective 4 (Ability to Multiply Whole Numbers), the trend reversed, with females scoring significantly higher (1.0% above the state) and males scoring significantly lower (1.2% below the state). On six objectives, no significant differences from the state were observed for either males or females: Objective 6 (Ability to Add and Subtract Decimals), Objective 8 (Ability to Add and Subtract Fractions), Objective 13

(Ability to Interpret Charts and Graphs), Objective 3 (Ability to Add and Subtract Whole Numbers), Objective 5 (Ability to Divide Whole Numbers), and Objective 7 (Ability to Multiply Decimals).

Size of community. Test results were reported according to the size of community. There were four reporting groups for this variable: big city students, fringe city students, medium city students, and smaller community students. Significant differences from the state average on total test score were found in communities of all sizes with the exception of the medium cities. The big city students scored 12.4% below the state, whereas fringe city students scored 3.0% above the state, and smaller community students scored 3.6% above the state.

In five of the six goal areas, the trend exactly parelleled the trend on total test score. That is, the big cities reported scores significantly below the state, the medium cities reported scores not significantly different from the state, and the fringe cities and smaller communities reported scores significantly above the state, with the smaller communities showing slightly higher scores than the fringe communities. The one exception was Goal Area 5 (Problem Solving), in which the only difference from the total test trend was that the fringe cities showed a slightly higher score than the smaller communities. The largest differences were observed in Goal Area 3 (Measurement), with big cities 16.2% below the state and small communities 4.8% above the state. The smallest significant differences were observed in Goal Area 4 (Charts and Graphs), with the big cities 9.6% below the state and the small communities 2.7% above the state.

The trend across objectives also closely resembled the trend on total test score, although on four objectives the fringe cities slightly outscored the small communities, rather than vice versa (Objective 7: Ability to Multiply Decimals, Objective 12: Knowledge of Metric Units of Measure, Objective 14: Math Skills Word Problems, and Objective 15: Real World Word Problems). In addition, fringe city scores on Objective 5 (Ability to Divide Whole Numbers) were not significantly different from the state. The largest differences were found on Objective 8 (Ability to Add and Subtract Fractions), with the big cities 19.9% below the state and small communities 5.6% above the state, and on Objective 12 (Knowledge of Metric Units of Measure), with the big cities 20.0% below and the fringe cities 6.5% above the state. The smallest significant differences were found on Objective 3 (Ability to Add and Subtract Whole Numbers), with the big cities 3.6% below the state and small communities 1.3% above the state.

Region of state. Test results were reported according to the six regions of the state: Region 1—RESCUE, Region 2—Cooperative Educational Services, Region 3—CREC, Region 4—ACES, Region 5—Project Learn, and Region 6—N.A.R.S.E.S. Significant differences from the state on total test score were found in Region 2 (4.9% above the state), Region 3 (2.9% above the state), and Region 4 (2.2% above the state). Region 1, Region 5, and Region 6 scores were not significantly different from the state.

Differences by region across goal areas were somewhat similar to those found on total test score. Region 2 was significantly above the state in all goal areas except Goal Area 2 (Computation), where there was no significant difference. Region 4 was significantly above the state in all goal areas except Goal Area 1 (Mathematical Concepts), where there was no significant difference. Region 1 was significantly above the state in Goal Area 4 (Charts and Graphs) and Goal Area 6 (Geometry), and showed no significant differences in the other goal areas. Region 6 was not significantly different from the state in five goal areas but was significantly below in Goal Area 6.

There was somewhat more variability in the results by region across objectives. Region 3 was significantly above the state on Objective 1 (Understanding of Rational Numbers), Objective 2 (Understanding of Ordering of Numbers), Objective 6 (Ability to Add and Subtract Decimals), Objective 10 (Knowledge of Area and Perimeter), Objective 11 (Ability to Convert U.S. Units of Measure), Objective 12 (Knowledge of Metric Units of Measure), Objective 13 (Ability to Interpret Charts and Graphs), Objective 14 (Math Skills Word Problems), Objective 15 (Real World Word Problems), and Objective 16 (Knowledge of Geometric Concepts).

Region 2 was significantly above the state on Objective 2, Objective 4 (Ability to Multiply Whole Numbers), Objective 5 (Ability to Divide Whole Numbers), Objective 6, Objective 7 (Ability to Multiply Decimals), Objective 8 (Ability to Add and Subtract Fractions), Objective 9 (Ability to Multiply Fractions and Mixed Numbers), Objective 10, Objective 11, Objective 12, Objective 13, Objective 14, and Objective 16.

Region 1 was significantly above the state on Objective 3 (Ability to Add and Subtract Whole Numbers), Objective 6, Objective 7, Objective 12, Objective 13, and Objective 16.

Region 4 was significantly above the state on Objective 3, Objective 4, Objective 7, Objective 11, Objective 12, Objective 13, and Objective 16.

Region 6 was significantly below the state on Objectives 2, 14, and 16. Region 5 showed no significant differences on any objective.

Socioeconomic status. Total test scores were reported according to three levels of socioeconomic status—high, medium, and low. Significant differences from the state on total test score were observed in all three reporting groups, with the low socioeconomic status group 6.0% below the state, the medium socioeconomic status group 1.4% above the state, and the high socioeconomic status group 4.9% above the state.

Parental discussion of school. Students were asked whether they talked to their parents about school "daily," "weekly," "monthly," or "hardly ever." Significant differences from the state on total test score were observed for every group except the group that reported speaking to parents weekly. There was a consistent trend for students discussing school more frequently to have higher scores relative to the state. Specifically, the group that reported "hardly ever" having such discussions scored 4.8% below the state, the group that reported monthly discussion scored 2.7% below the state, and the group that reported daily discussions scored 0.8% above the state.

Parental encouragement of schoolwork. Students were asked whether they received "a lot," "quite a bit," "only a little," or "hardly any" encouragement from their parents about schoolwork. Significant differences from the state on total test score were observed only for the groups reporting "only a little" encouragement (2.8% below the state) and "a lot" of encouragement (1.1% above the state).

Television watching. Students were asked whether each day they watched television "less than one hour," "between one and two hours," "between two and three hours," "between three and four hours," or "more than four hours." Significant differences from the state on total test score were observed in every group except that reporting between three and four hours of television watching daily. There was a consistent trend for scores to increase relative to the state as television watching declined. Specifically, the "more than four hours" per day group scored 4.4% below the state, the "two to three hour" group scored 1.8% above the state, the "one to two hour" group scored 3.4% above the state, and the "less than one hour" group scored 3.9% above the state.

Attitude toward school. Students were asked how much they liked school. Responses were "I hate it," "I don't like it," "It's O.K.," "I like it," and "I like it a lot." Significant differences from the state on total test score were found for every response group except that reporting to like school a lot, with performance relative to the state generally increasing consistently as attitude toward school became more positive. Specifically, the "hate school" group scored 3.1% below the state, the "don't like school" group scored 2.1% below the state, the "school's O.K." group scored 1.3% below the state, and the "like school" group scored 2.8% above the state.

Attitude toward mathematics. Students were asked whether they liked mathematics "very much," "somewhat," or "not at all." Significant differences from the state on total test score were observed in all three groups, with performance relative to the state improving as attitude toward mathematics became more positive. Specifically, those who don't like mathematics at all scored 4.0% below the state, those who like mathematics "somewhat" scored 0.5% below the state, and those who like mathematics "very much" scored 2.6% above the state.

Perceived utility of mathematics compared to other subjects. Students were asked whether, in comparison to other subjects they studied, they felt that mathematics was "very useful," "somewhat useful," or "not very useful." Significant differences from the state on total test score were found in each reporting group, with performance relative to the state improving as perceived usefulness increased. Thus, those who feel that mathematics is "not very useful" scored 4.8% below the state, those who feel that it is "somewhat useful" scored 1.5% below the state, and those who feel it is "very useful" scored 1.6% above the state.

Availability of consultants or specialists. Total test scores were reported according to whether or not a student's principal stated that consultants or specialists worked with mathematics teachers in the school. No significant differences from the state were observed for either reporting group.

Achievement level organization of classroom. Total test scores were reported according to whether a student's principal stated that the predominate form of classroom organization in the school was according to achievement level or irrespective of achievement level. No significant differences from the state were observed for either reporting group.

Type of mathematics instruction. Total test scores were reported according to whether a student's principal stated that the typical mathematics classroom for 13-year-olds utilized traditional teacher-centered activities or individualized instruction. No significant differences from the state were found for either reporting group.

Curriculum or program development. Total test scores were reported according to whether or not a student's principal stated that there had been major curriculum or program development in mathematics in the school during the last five years. No significant differences from the state were found for either reporting group.

Class size. Total test scores were reported according to whether or not a student's principal stated that mathematics teachers in the school felt that class sizes were too large. A significant difference from the state was observed in the group of students whose principals reported that mathematics teachers felt that classes were not too large, with this group scoring 0.9% above the state. No significant difference from the state was found in the other reporting group.

Comparing 17-Year-Old Reporting Groups

Sex of student. Statistically significant differences from the state on total test score were observed for both males (3.0% above the state) and females (2.3% below the state).

Male students scored significantly above the state, and females scored significantly below the state in every goal area except Goal Area 2 (Computation), where no significant differences from the state were observed. The largest significant differences were found in Goal Area 6 (Geometry), with males 6.7% above the state and females 5.0% below the state. The smallest statistically significant differences were found in Goal Area 4 (Charts and Graphs), with males 0.6% above the state and females 0.4% below the state.

On 10 of the 16 objectives, males scored significantly above the state and females scored significantly below the state. The largest significant differences were found on Objective 2 (Understanding of Ordering of Numbers), with males 9.3% above and females 7.0% below the state. The smallest statistically significant differences consistent with the trend on total test score (i.e., males above and females below the state) were found on Objective 13 (Ability to Interpret Charts and Graphs), with males 0.6% above and females 0.4% below the state. The trend found on total test score was reversed on Objective 4 (Ability to Multiply Whole Numbers), with females significantly above (0.7%) and males significantly below (0.9%) the state. No significant differences from the state were found for either males or females on Objective 3 (Ability to Divide Whole Numbers), Objective 6

(Ability to Add and Subtract Decimals), Objective 7 (Ability to Multiply and Divide Decimals), and Objective 9 (Ability to Multiply and Divide Fractions).

Size of community. Test scores were reported according to the size of the student's community: big city, fringe city, medium city, or small community. On total test score, significant differences from the state were found in each reporting group. The big cities were 12.9% below the state, the fringe cities were 1.5% above the state, medium cities were 2.2% above the state, and small communities were 2.4% above the state.

Across goal areas, the big cities were significantly below the state in every goal area. The largest difference for this group was found in Goal Area 3 (Measurement), with big cities 17.9% below the state. Smaller communities were significantly above the state in every goal area. The largest difference was observed in Goal Area 6 (Geometry), with small communities scoring 3.9% above the state. The medium cities scored significantly above the state in all but two goal areas (Goal Area 1: Mathematical Concepts and Goal Area 6: Geometry), where no significant differences were found. The fringe cities scored significantly above the state in only two goal areas (Goal Area 1: Mathematical Concepts and Goal Area 4: Charts and Graphs), and showed no significant differences from the state in the other four goal areas.

Across objectives, the big cities scored significantly below the state on all objectives, the largest difference below the state occurring on Objective 10 (Knowledge of Area and Perimeter), where big cities scored

20.2% below the state and the smallest significant difference below the state occurring on Objective 3 (Ability to Add and Subtract Whole Numbers), where big cities scores 3.4% below the state. The fringe cities scored significantly above the state on five objectives (1: Understanding of Rational Numbers, 2: Understanding of Ordering of Numbers, 5: Ability to Divide Whole Numbers, 9: Ability to Multiply and Divide Fractions, and 13: Ability to Interpret Charts and Graphs), and showed no significant differences from the state on any other objectives. Medium cities scored above the state on nine objectives (4: Ability to Multiply Whole Numbers, 6: Ability to Add and Subtract Decimals, 8: Ability to Add and Subtract fractions, 10: Knowledge of Area and Perimeter, 11: Ability to Convert U.S. Units of Measure, 12: Knowledge of Metric Units of Measure, 13: Ability to Interpret Charts and Graphs, 14: Math Skills Word Problems, and 15: Real World Word Problems) and showed no significant differences from the state on the other seven objectives. Smaller communities scored significantly above the state on 11 objectives (2, 5, 6, 7, 8, 10, 11, 12, 13, 14, and 16) and showed no significant differences from the state on the remaining five objectives. The greatest difference above the state for any group across all objectives was found on Objective 10, where small communities scored 4.9% above the state.

Region of state. Test results were reported according to the six regions of the state: Region 1—RESCUE, Region 2—Cooperative Educational Services, Region 3—CREC, Region 4—ACES, Region 5—Project Learn, and Region 6—N.A.R.S.E.S. Significant differences from the state on total test score were found in Region 2 (3.6% above the state), Region 3 (3.2% above the state), and Region 1 (2.3% above the state). No significant differences from the state on total test score were found in other regions.

Across goal areas, Region 2 and Region 3 scored significantly above the state in all six goal areas. Region 1 scored significantly above the state in all areas except Goal Area 1 (Mathematical Concepts) and Goal Area 4 (Charts and Graphs), where performance was not significantly different from the state. Region 6 scored significantly above the state in Goal Area 3 (Measurement), Goal Area 4 (Charts and Graphs), and Goal Area 5 (Problem Solving) but was not significantly different from the state in the other three goal areas. Region 5 scores were not significantly different from the state in any goal area. Region 4 scored significantly below the state in Goal Area 6 (Geometry) but was not significantly different from the state in the other five goal areas. The greatest significant difference above the state across all goal areas for all regions was observed in Goal Area 5 (Problem Solving), where Region 6 scored 6.2% above the state and in Goal Area 6 (Geometry), where Region 2 scored 6.2% above the state. The greatest significant difference below the state across all goal areas for all regions was found in Goal Area 6 (Geometry), where Region 4 scored 4.7% below the state.

Across objectives, Region 3 scored significantly above the state on all objectives except Objective 3 (Ability to Add and Subtract Whole Numbers), Objective 7 (Ability to Multiply and Divide Decimals), and Objective 9 (Ability to Multiply and Divide Fractions), in each of which no significant differences from the state were found. Region 2 scored significantly above the state on all objectives except Objective 4 (Ability to Multiply Whole Numbers), Objective 7 (Ability to Multiply and Divide Decimals), Objective 9 (Ability to Multiply and Divide Fractions), Objective 11 (Ability to Convert U.S. Units of Measure), and Objective 15 (Real World Word Problems), in each of which no significant differences from the state were observed. Region 1 scored significantly above the state on half of the objectives: Objective 6 (Ability to Add and Subtract Decimals), Objective 8 (Ability to Add and Subtract Fractions), Objective 9 (Ability to Multiply and Divide Fractions), Objective 10 (Knowledge of Area and Perimeter), Objective 11 (Ability to Convert U.S. Units of Measure), Objective 12 (Knowledge of Metric Units of Measure), Objective 15 (Real World Word Problems), and Objective 16 (Knowledge of Basic Geometric Concepts). Region 6 scored significantly above the state on four objectives: Objective 10, Objective 11, Objective 13 (Ability to Interpret Charts and Graphs), and Objective 14 (Math Skills Word Problems). Region 5 scored significantly above the state on three objectives: Objective 4, Objective 5 (Ability to Divide Whole Numbers), and Objective 11. Region 4 scored significantly below the state on two objectives: Objective 6 and Objective 16. The largest difference above the state across all objectives for all regions was observed on Objective 10, where Region 6 scored 9.7% above the state. The largest difference below the state across all objectives for all regions was observed on Objective 16, where Region 4 scored 4.7% below the state.

Socioeconomic status. Total test scores were reported according to three levels of socioeconomic status—high, medium, and low. Significant differences from the state on total test score were found in all three reporting groups, with low socioeconomic-status students 5.2% below the state, medium socioeconomic-status students 1.6% above the state, and high socioeconomic-status students 3.6% above the state.

Parental encouragement of schoolwork. Students were asked whether they received "a lot," "quite a bit," "only a little," or "hardly any" encouragement from their parents about schoolwork. A significant difference from the state on total test score was observed only for the group reporting "hardly any" parental encouragement. This group scored 3.6% below the state.

Television watching. Students were asked whether each day they watched television "less than one hour," "between one and two hours," "between two and three hours," "between three and four hours," or "more than four hours." Performance relative to the state improved consistently as amount of daily television watching declined, with all reporting groups except that watching television between two and three hours daily showing significant differences from the state. Specifically, the "more than four hours" per day group scored 9.5% below the state, the "three to four hours" group scored 2.9% below the state, the "one to two hours" group scored 1.9% above the state, and the "less than one hour" group scored 4.4% above the state.

Attitude toward school. Students were asked how much they liked school. Response options were "I hate it," "I don't like it," "It's O.K.," "I like it," "I like it a lot." Significant differences from the state on total test score were found for every reporting group, and performance improved fairly consistently as attitude toward school became more positive. Specifically, the group hating school scored 5.1% below the state, the group not liking school scored 2.1% below the state, the group thinking school is "O.K." scored 1.4% below the state, the group liking school "a lot" scored 2.2% above the state, and the group liking school scored 2.9% above the state.

School aspirations. Students were asked to state the highest level of schooling they would like to attain. The response options were "not finish high school"; "graduate from high school"; "graduate from a vocational, technical, or business school after high school"; "go to a two-year college"; "go to a four year college"; and "go to graduate or professional school after college." Significant differences from the state on total test score were found for all reporting groups except that not wanting to complete high school. Performance relative to the state consistently improved as educational ambitions increased. Specifically, those wanting only to finish high school scored 11.9% below the state, those wanting to attend a vocational or technical school scored 6.5% below the state, those wanting to attend a two-year college scored 3.8% below the state, those wanting to attend a four-year college scored 4.9% above the state, and those wanting to attend graduate or professional school scored 10.6% above the state.

Attitude toward mathematics. Students were asked whether they liked mathematics "very much," "somewhat," or "not at all." Significant differences from the state on total test score were observed for every reporting group except those liking mathematics "somewhat." Performance relative to the state improved as attitude toward mathematics became more positive, with those not liking it at all scoring 6.2% below the state and those liking it "very much" scoring 6.6% above the state.

Perceived utility of mathematics compared to other subjects. Students were asked whether, in comparison to other subjects they studied, they felt that mathematics was "very useful," "somewhat useful," or "not very useful." Significant differences from the state on total test score were observed for all reporting groups, with performance consistently improving as perceived usefulness increased. Specifically, those who felt mathematics was "not very useful" in comparison to other subjects scored 5.5% below the state, those who felt it was "somewhat useful" scored 1.2% below the state, and those who felt it was "very useful" scored 3.3% above the State.

Perceived utility of mathematics outside of school. Students were asked whether, in their lives outside of school, they found mathematics "very useful," "somehwat useful," or "not very useful." Significant differences from the state on total test score were found for every reporting group except those stating that they found mathematics "not very useful." In contrast to the results obtained on perceived utility of mathematics in comparison to other subjects studied, on this variable students who found mathematics "very useful" scored significantly *below* the state (2.7% below), whereas those who found mathematics "somewhat useful" scored significantly above the state (0.9% above). This apparent anomaly may be explained by the facts that a higher percentage of "big city students reported that they found mathematics "very useful" (See Chapter 6: Results of the Student Questionnaire) and that "big city" students scored somewhat below the state on total test score (see this chapter, above).

Years of mathematics. Seventeen-year-olds were asked how many years of mathematics instruction they had in grades nine, 10, and 11 ("none," "1 year," "2 years," or "3 years"). Significant differences from the state on total test score were found for all reporting groups, with performance consistently improving as number of years of mathematics instruction increased. Specifically, those with no mathematics instruction in these three grades scored 22.7% below the state, those with one year scored 17.2% below the state, those with two years scored 8.3% below the state, and those with three years scored 4.6% above the state.

Availability of consultants or specialists. Total test scores were reported according to whether or not a student's principal reported that consultants or specialists worked with mathematics teachers in the school. No significant differences from the state were found for either reporting group.

Achievement level organization of classrooms. Total test scores were grouped according to whether a student's principal reported that the predominate form of classroom organization in the school was by achievement level or irrespective of achievement level. No significant differences from the state were found for either reporting group.

Curriculum or program development. Total test scores were grouped according to whether or not a student's principal reported that major curriculum or program development in mathematics had occurred in the school during the last five years. No significant differences from the state were observed for either reporting group.

Class size. Total test scores were grouped according to whether or not a student's principal reported that mathematics teachers in the school felt that class sizes were too large. No significant differences from the state were found for either reporting group.

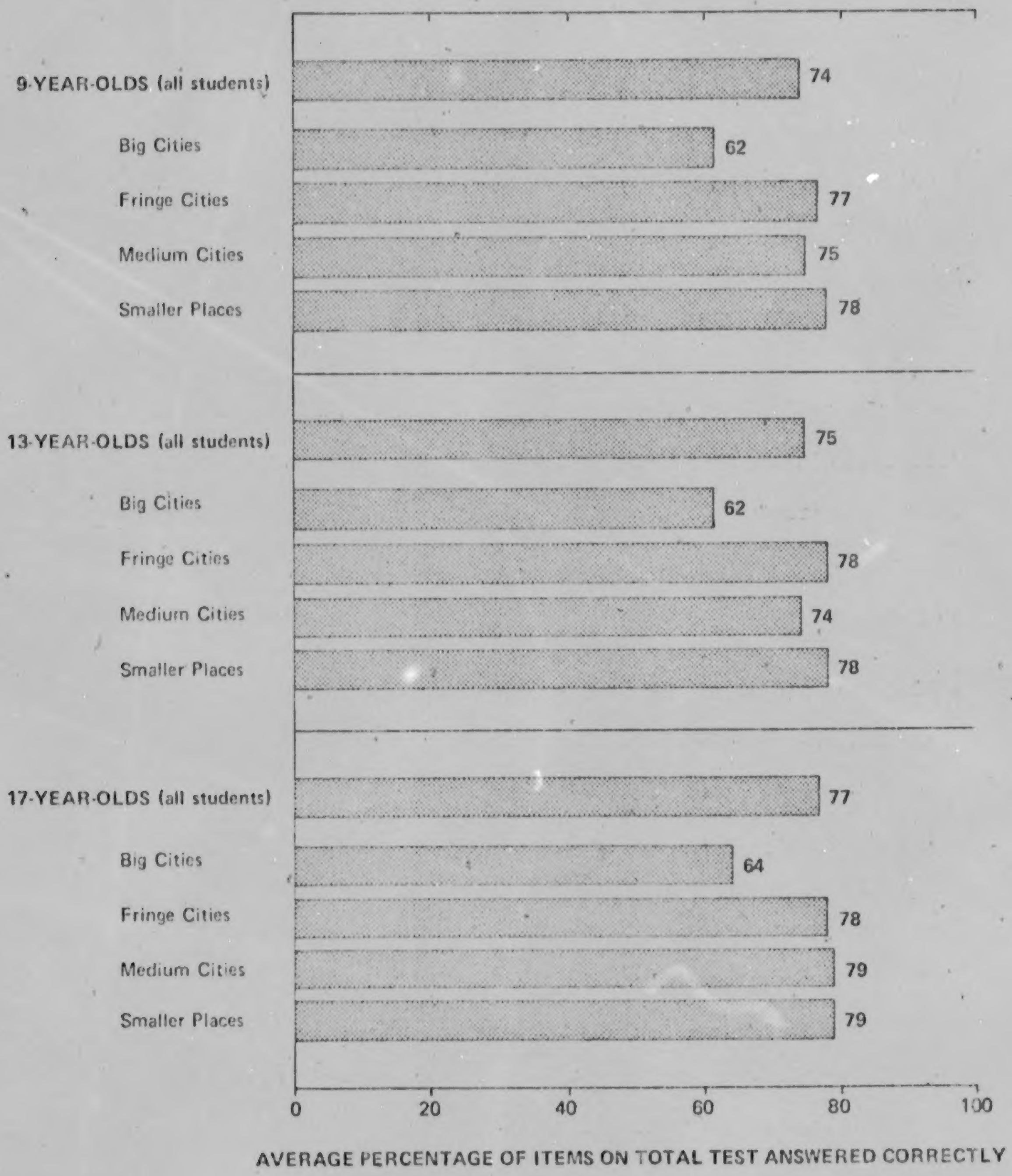
Summary

- Nine-year-old males and females performed the same as the state, whereas 13- and 17-year-old males performed above and 13- and 17-year-old females performed below the state, with the magnitude of the differences increasing at the upper age level.

- Big city students at each age level performed well below the state. Medium city 9- and 13-year-olds performed the same as the state, although their 17-year-olds performed above the state. Fringe city and smaller community students at each age level exceeded the state, with smaller communities above fringe cities at each age level (see Table 4.1).

TABLE 4.1

Graph of Achievement on Total Test by Size of Community



- Regions 2 and 3 students of all age levels performed above the state, with Region 3 below Region 2 at each age level. In addition, Region 5 9-year-olds, Region 4 13-year-olds, and Region 1 17-year-olds performed above the state (see Table 4.2).

- There was a consistent trend at each age level for performance relative to the state to improve as socioeconomic status improved, with low socioeconomic status students somewhat below, medium socioeconomic status students slightly above, and high socioeconomic status students somewhat above the state.

- There was a tendency for performance of 9- and 13-year-olds relative to the state to improve as frequency of discussion of school with parents increased. This trend was slightly more pronounced for 9-year-olds. (This variable was not assessed for 17-year-olds.)

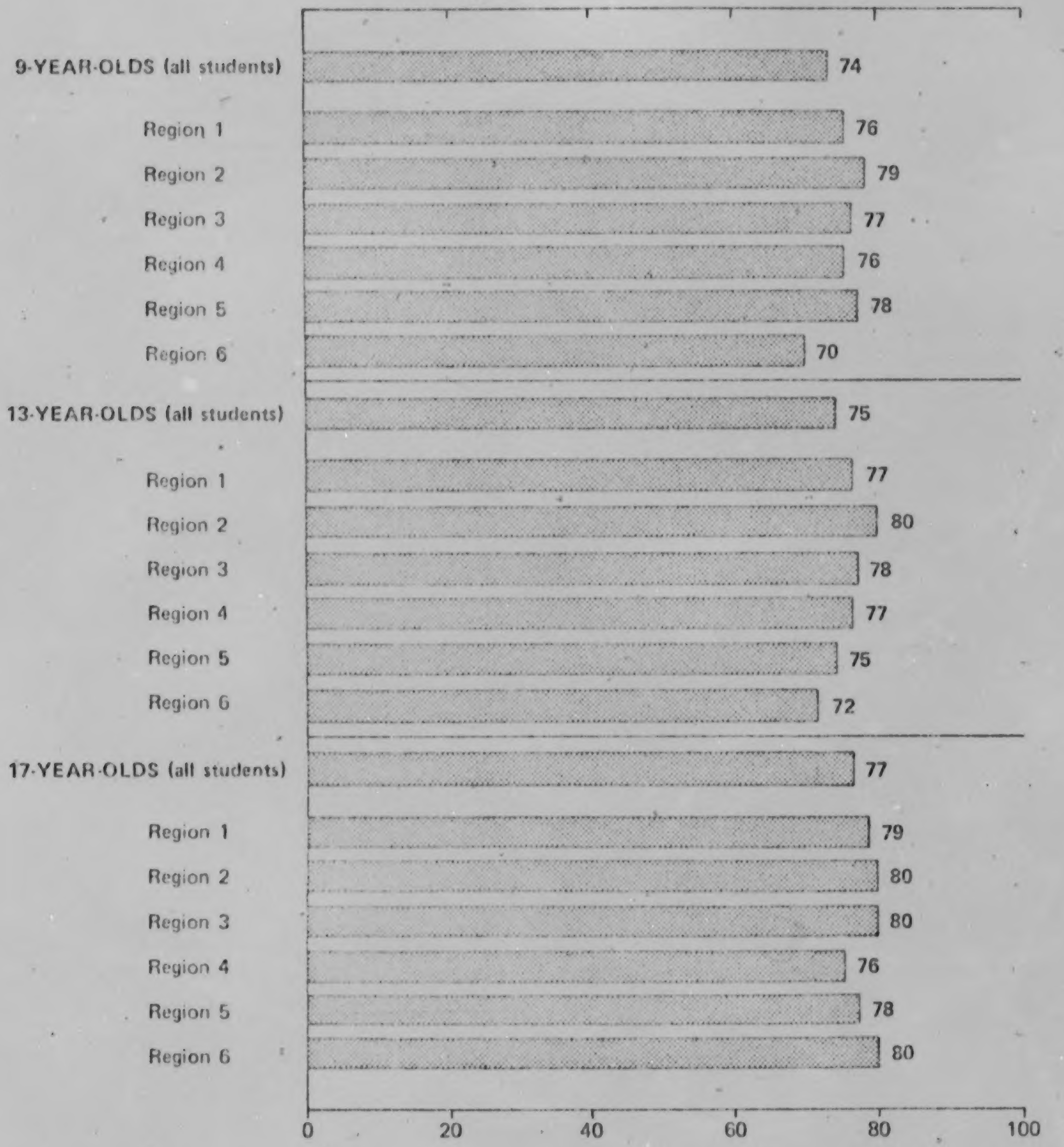
- Nine-year-olds whose parents helped them with schoolwork scored slightly *below* the state, whereas those whose parents did not help scored slightly above the state. (This variable was not assessed for 13- and 17-year-olds.)

- There was some tendency for the performance of 13- and 17-year-olds relative to the state to improve as parental encouragement of schoolwork increased, with this trend more pronounced for 13-year-olds. (This variable was not assessed for 9-year-olds.)

- At the 9-year-old level, performance relative to the state improved, then declined, as time watching television increased. In contrast, at the

TABLE 4.2

Graph of Achievement on Total Test by Region*



*Results for *all students* include Big Cities. Results by region do *not* include Big Cities because the scores of Big City students tend to differ from those of students in their respective regions according to information from previous assessments in Connecticut.

13- and 17-year-old levels, performance steadily declined as time watching television increased, with this trend somewhat more pronounced at the 17-year-old level.

- There was a general trend at each age level for performance relative to the state to improve as the student's attitude toward school became more positive.

- There was a general trend at each age level for performance relative to the state to improve as the student's attitude toward mathematics became more positive, with this trend most pronounced at the 17-year-old level.

- There was a fairly strong tendency at each level for performance to improve as the student's perception of the utility of mathematics compared to other subjects studied became more positive.

- Seventeen-year-olds who find mathematics "very useful" outside of school scored somewhat *below* the state, those who find it "somewhat useful" scored slightly *above* the state, and those who find it "not very useful" scored the same as the state. (This variable was not assessed at the 9- and 13-year-old levels.)

- At the 17-year-old level, there was a very strong tendency for performance to improve as years of mathematics instruction increased. (This variable was not assessed at the 9- and 13-year-old levels.)

- There was a strong tendency for performance to improve as educational aspirations increased. Those students who aspired to a two-year college scoring 3.8% *below* the state. Those wanting to attend a four-year college or graduate school scoring *above* the state by 4.9% and 10.6%, respectively.

- Nine-year-olds in schools with mathematics specialists or consultants scored below the state, whereas those in schools without specialists or consultants scored above the state. No differences were observed at the 13- and 17-year-old levels.

- No differences from the state at any age level were found according to whether or not students attended schools that generally assigned students to classes on the basis of achievement level.

- No differences from the state at any age level were found according to whether or not students attended schools that have had major mathematics curriculum or program development in the last five years.

- No differences from the state at the 13-year-old level were found according to whether students attended schools that generally employed traditional teacher-centered activities or generally employed individualized instruction in mathematics, although at the 9-year-old level students attending schools generally utilizing individualized instruction scored below the state. (This variable was not assessed at the 17-year-old level.)

- Nine-year-olds who attended schools whose principals reported that mathematics teachers felt that classes were too large scored somewhat below the state, whereas 9- and 13-year-olds who attended schools whose principals reported that mathematics teachers felt that classes were not too large scored slightly above the state. No other differences from the state were observed.

CHAPTER 5

COMPARING CONNECTICUT WITH THE NATION AND THE NORTHEAST REGION

Introduction

This chapter compares the performance of Connecticut 9-, 13-, and 17-year-old students to the performance of students in the nation and the Northeast region of the United States on selected items in the goal area of Mathematics. Results for students nationwide and in the Northeast were collected by the National Assessment of Educational Progress (NAEP) and include data only for students who were currently enrolled in school. A small number of the NAEP items used in the Connecticut Assessment of Educational Progress in Mathematics were drawn from NAEP's goal area of Career and Occupational Development (numerical skills useful in the world of work).

Comparative results are available only for those items on the tests that were developed by NAEP and administered *without modification* in Connecticut at the same age levels at which NAEP administered them. While a number of items on the CAEP tests were drawn from NAEP materials and modified by the Advisory Committee (e.g., changes in distractors, conversion from open-ended to multiple-choice format), appropriate comparative data are not available for these items. The results presented in this chapter are limited to a description of the 14 items for 9-year-olds, the 20 items for 13-year-olds, and the 23 items for 17-year-olds that were identical NAEP items.

Comparison groups. At each grade level, results for Connecticut students are compared to results for the corresponding groups of students assessed by NAEP nationwide and in the Northeast, yielding the following comparisons:

(1) all students
- Connecticut students versus United States students
- Connecticut students versus Northeast students

(2) comparisons by sex
- Connecticut males versus United States males
- Connecticut females versus United States females

Data analysis. The following results are presented as the percentage of students who answered each of the selected NAEP items correctly. These percentages are given at each age level for (1) all national students, (2) national males, (3) national females, (4) all Northeast students, (5) all Connecticut students, (6) Connecticut males, and (7) Connecticut females. Tables 5.1, 5.2, and 5.3 present comparative results for 9-, 13-, and 17-year-olds respectively. In the tables, the NAEP items are listed by item number (question position) on the test and displayed under the goal area within which the item was classified in CAEP. An asterisk beside a value in the table indicates that the performance of the comparison group was significantly different from that of Connecticut students at or beyond the 95% level of confidence.

Interpretation of Results

There are certain differences between CAEP testing and NAEP testing that bear on the interpretation of results. First, no paced audiotapes were used for test administration in Connecticut; NAEP uses paced audiotapes for test directions and for every test item. Second, Connecticut tested age-eligible groups of students in the *target grade* only. Thus, while *all* students tested by CAEP were *age-eligible* according to NAEP guidelines, 9-year-olds were drawn from the fourth grade *only*, 13-year-olds were drawn from the eighth grade *only*, and 17-year-olds were drawn from the eleventh grade *only*. NAEP sampled students solely on the basis of age-eligibility, regardless of the grade in which the students were enrolled. The reader should exercise caution when drawing inferences from the comparative results, bearing in mind these differences in the CAEP and NAEP research designs.

The next three sections of this chapter describe comparative results for 9-, 13-, and 17-year-olds, respectively. Each section contains a table displaying individual item results for all comparison groups. The chapter concludes with a summary of these data in narrative and graphic form.

Comparative Results for 9-Year-Olds

Table 5.1 contains a comparison between CAEP and NAEP results for the 14 NAEP items appearing on the test for 9-year-olds.

Mathematical Concepts. There were two NAEP items measuring Mathematical Concepts for 9-year-olds. On both NAEP items the total group of Connecticut 9-year-olds performed significantly better than 9-year-olds nationally and equally as well as Northeast 9-year-olds. On both items, Connecticut 9-year-old males performed equally as well as 9-year-old males nationally. Connecticut 9-year-old females performed significantly better than 9-year-old females nationally on one item and equally as well on the other.

Computation. On all four NAEP items measuring Computation, the Connecticut 9-year-olds significantly outperformed their national counterparts. However, with respect to Northeast students, Connecticut 9-year-olds performed significantly better on two of the four items and equally as well on the other two items. Nine-year-old Connecticut males performed significantly better than male 9-year-olds nationally on all four items. Connecticut 9-year-old females performed significantly better than female 9-year-olds nationally on three of the four items and comparably on the fourth item.

Problem Solving. On four of the five NAEP items on Problem Solving, Connecticut 9-year-olds as a group performed significantly better than

TABLE 5.1

Comparative Results on Individual NAEP Items for Connecticut, National, and Northeast 9-Year-Olds

Description of Item	All 9-Year-Olds			Males		Females	
	Connecticut	NAEP National	NAEP Northeast	Connecticut	NAEP National	Connecticut	NAEP National
MATHEMATICAL CONCEPTS							
8. Identify digit in tens place	79.1	75.2*	81.4	79.8	75.5	78.5	74.9
14. Place values in 762	80.9	74.3*	79.9	81.8	76.5	80.2	72.0*
COMPUTATION							
13. 1054 - 865 = (open-ended)	50.9	27.2*	33.8*	48.4	25.8*	53.1	28.5*
20. 38 + 19 = (open-ended)	88.8	79.0*	85.5	87.3	76.8*	90.2	81.2*
21. 36 - 19 = (open-ended)	77.3	55.0*	63.3*	75.7	51.1*	78.8	59.0*
22. $3.06 + 10.00 + (.14 + 5.10 = (open-ended)	48.4	39.9*	48.1	47.4	34.8*	49.1	45.1

* Significantly different from CAEP at or beyond the .05 level of confidence.

TABLE 5.1 (continued)

Description of Item	All 9-Year-Olds			Males		Females	
	Connecticut	NAEP National	NAEP Northeast	Connecticut	NAEP National	Connecticut	NAEP National
PROBLEM SOLVING							
1. At rate of 5 minutes per window, how could one figure number of minutes to wash 10 windows?	61.1	50.4*	55.6	61.8	51.2*	60.5	49.6*
12. Perimeter of garden 9 feet long, 5 feet wide (open-ended)	8.3	6.9	7.5	11.0	8.6	5.9	5.2
19. Rocket aimed at target 525 miles south, landed 624 miles south. Missed target by how many miles? (open-ended)	39.4	21.5*	26.3*	40.0	22.6*	38.9	20.4*
23. At 2 biscuits a day, how long until dog eats 24 biscuits? (open-ended)	50.7	36.7*	41.7*	55.0	40.4*	47.0	33.0*
28. Which figure has same area as the figure above?	53.9	38.2*	41.2*	57.3	37.5*	50.9	38.8*

TABLE 5.1 (continued)

Description of Item	All 9-Year-Olds			Males		Females	
	Connecticut	NAEP National	NAEP Northeast	Connecticut	NAEP National	Connecticut	NAEP National
CHARTS AND GRAPHS							
37. Bar graph—who weighs most?	95.5	88.6*	90.8*	96.1	88.6*	94.9	88.5*
38. Bar graph—who weighs closest to 50 pounds?	69.6	60.6*	65.6	74.0	62.7*	65.6	58.5*
39. Bar graph—who weighs least?	94.4	83.4*	89.2	95.2	85.4*	93.7	83.2*

9-year-olds nationally, and the same was true of Connecticut males and females, respectively. Nine-year-olds as a group significantly outperformed their Northeast counterparts on three of the five items. Connecticut 9-year-olds performed comparably with the nation and the Northeast on the remaining cases.

Charts and Graphs. Connecticut 9-year-old students as a group, male 9-year-olds, and female 9-year-olds performed significantly better than their respective national counterparts on all three NAEP items in the Charts and Graphs goal area. The comparison with the Northeast region shows that Connecticut students performed significantly better on one of the three items and comparably on the other two.

Comparative Results for 13-Year-Olds

Table 5.2 contains a comparison between CAEP and NAEP results for the 20 NAEP items appearing on the test for 13-year-olds.

Mathematical Concepts. There were three NAEP items for this goal area and, as a group, Connecticut 13-year-olds performed significantly better than 13-year-olds nationally on two of the three NAEP items and equally as well on the third. Compared to 13-year-olds in the Northeast, Connecticut 13-year-olds performed equally as well on all three items. However, Connecticut 13-year-old males performed significantly better on all three items than did 13-year-old males nationally, whereas females performed

TABLE 5.2

Comparative Results on Individual NAEP Items for Connecticut, National, and Northeast 13-Year-Olds

Description of Item	All 13-Year-Olds			Males		Females	
	Connecticut	NAEP National	NAEP Northeast	Connecticut	NAEP National	Connecticut	NAEP National
MATHEMATICAL CONCEPTS							
14. Fractional part that is greatest	30.0	26.2*	28.4	39.5	31.4*	22.0	21.1
19. Number that is greatest (decimals)	85.5	84.3	86.0	90.5	87.8*	81.4	80.7
25.[a] 1/5 is equivalent to what percent? (open-ended)	54.5	40.9*	50.4	59.9	42.4*	50.0	39.5*
COMPUTATION							
1. 38 x 9 = (open-ended)	86.7	82.6*	85.7	85.2	78.9*	88.0	86.0
3. 38 + 19 = (open-ended)	95.6	94.3*	95.5	95.1	93.0*	96.0	95.5
9. 36 - 19 = (open-ended)	93.1	88.9*	92.1	92.6	86.1*	93.4	91.5

* Significantly different from CAEP at or beyond the .05 level of confidence.

[a] Item from NAEP Career and Occupational Development 1973-74.

TABLE 5.2 (continued)

Description of Item	All 13-Year-Olds			Males		Females	
	Connecticut	NAEP National	NAEP Northeast	Connecticut	NAEP National	Connecticut	NAEP National
COMPUTATION (cont'd)							
12. 1054 - 865 = (open-ended)	86.8	80.0*	83.4	86.8	78.1*	86.9	82.0*
24. $3.06 + 10.00 + 9.14 + 5.10 = (open-ended)	88.1	84.3*	88.6	87.1	81.7*	89.0	87.1
27. 125 ÷ 5 = (open-ended)	93.5	88.5*	91.8	93.3	87.1*	93.6	89.8*
50. If 23.8 is subtracted from 62.1 (open-ended)	72.3	60.5*	71.3	72.3	57.7*	72.4	63.3*
MEASUREMENT							
49. 1½ pounds = ___ ounces (open-ended)[a]	57.5	67.9*	68.5*	66.4	69.9	50.1	65.8*
CHARTS AND GRAPHS							
46. Reading table of sock sizes[a]	88.1	66.6*	69.5*	88.1	61.6*	88.1	71.1*

TABLE 5.2 (continued)

Description of Item	All 13-Year-Olds			Males		Females	
	Connecticut	NAEP National	NAEP Northeast	Connecticut	NAEP National	Connecticut	NAEP National
CHARTS AND GRAPHS (cont'd)							
65. Reading a bar graph (open-ended)[a]	91.6	94.6*	96.5	91.4	93.5	91.7	95.8*
PROBLEM SOLVING							
10. Several people received votes; what percentage of total vote did one of the people receive? (open-ended)	27.2	17.4*	24.8	32.5	20.7*	22.8	14.3*
11. At 10% and 15% discounts, what are differences in price for TV set regularly priced at $100? (open-ended)	60.9	48.7*	54.2 *	65.3	49.0*	57.1	48.4*
26. Person left for work at 7:45 A.M., returned home 10 hours later at what time? (open-ended)	79.7	62.6*	70.7*	82.2	64.7*	77.5	60.3*

TABLE 5.2 (continued)

Description of Item	All 13-Year-Olds			Males		Females	
	Connecticut	NAEP National	NAEP Northeast	Connecticut	NAEP National	Connecticut	NAEP National
PROBLEM SOLVING (cont'd)							
48. Mary took four tests and received four different numbers of items correct. How many items were incorrect? (open-ended)	76.4	60.0*	69.5	77.0	59.7*	75.9	60.3*
51. Three people earned money. What was the average amount earned? (open-ended)	55.7	38.4*	46.0*	58.8	37.9*	53.0	38.9*
52. Rocket aimed at target 525 miles south, landed 624 miles south. Missed target by how many miles? (open-ended)	81.3	38.4*	46.0*	58.8	37.9*	53.0	38.9*
GEOMETRY							
13. Line segments in a circle; which is the diameter?	73.5	68.0*	69.0	77.6	71.8*	70.0	64.1*

significantly better on one of the three items and equally as well on the other two compared to 13-year-old females nationally.

Computation. On all seven of the NAEP items for this goal area, Connecticut 13-year-olds as a group performed significantly better than 13-year-olds nationally. By contrast, Connecticut 13-year-olds as a group performed equally as well as Northeast 13-year-olds on all seven items. Connecticut 13-year-old males performed significantly better than 13-year-old males nationally on all seven items, while Connecticut 13-year-old females performed significantly better on three of the items and equally as well on the other four items compared to 13-year-old females nationally.

Measurement. On the one NAEP item for this goal, Connecticut 13-year-olds performed significantly less well than 13-year-olds nationally and in the Northeast. Connecticut 13-year-old females also performed significantly less well than 13-year-old females nationally, while Connecticut males performed about the same as their national counterparts.

Charts and Graphs. There were two items from NAEP for this goal area. On one item Connecticut 13-year-olds uniformly outperformed all national and Northeast comparison groups. On the second item, 13-year-old females in Connecticut performed significantly less well than 13-year-old females nationally, as did the total group of 13-year-olds relative to their national counterparts. On comparisons for Connecticut males with national males and for all Connecticut 13-year-olds with Northeast 13-year-olds, performance was about the same.

Problem Solving. On all six NAEP items for this goal, Connecticut 13-year-olds as a group performed significantly better than 13-year-olds nationally. Comparisons with Northeast 13-year-olds show that Connecticut 13-year-olds performed significantly better on only three of the six items and equally as well as Northeast 13-year-olds on the other three. Both Connecticut 13-year-old males and females performed significantly better than their national counterparts on all six items.

Geometry. On the one NAEP item for this goal, Connecticut 13-year-olds as a group performed better than 13-year-olds nationally and equally as well as Northeast 13-year-olds. The comparisons for 13-year-old male and female groups show that Connecticut students performed significantly better than their national counterparts.

Comparative Results for 17-Year-Olds

Table 5.3 contains a comparison between CAEP and NAEP results for the 23 NAEP items appearing on the test for 17-year-olds.

Mathematical Concepts. In results for all comparisons on the four NAEP items for this goal, Connecticut students' performance was equivalent to that of their national and Northeast counterparts, with two exceptions: on one item, the total group of Connecticut students performed significantly less well than their Northeast counterparts, and on another item Connecticut males performed significantly less well than males nationally.

TABLE 5.3

Comparative Results on Individual NAEP Items for Connecticut, National, and Northeast 17-Year-Olds

Description of Item	All 17-Year-Olds			Males		Females	
	Connecticut	NAEP National	NAEP Northeast	Connecticut	NAEP National	Connecticut	NAEP National
MATHEMATICAL CONCEPTS							
7. ½ is equivalent to what percent? (open-ended)	63.0	64.7	68.8	68.3	67.4	58.9	61.7
49. Number that is greatest (decimals)	92.6	92.8	92.4	95.0	94.2	90.9	91.3
53. Number that is smallest (decimals)	76.9	75.3	75.1	82.8	77.7*	72.5	72.9
59. Fraction that is greatest	45.4	49.2	54.9*	60.6	59.5	33.8	38.7
COMPUTATION							
4. 38 x 9 = (open-ended)	88.0	87.5	88.2	86.8	87.9	88.9	87.1
6. 38 + 19 = (open-ended)	97.0	96.8	94.6	96.7	97.6	97.3	96.1

* Significantly different from CAEP at or beyond the .05 level of confidence.
a Item from NAEP Career and Occupational Development 1973-74.

TABLE 5.3 (continued)

Description of Item	All 17-Year-Olds			Males		Females	
	Connecticut	NAEP National	NAEP Northeast	Connecticut	NAEP National	Connecticut	NAEP National
COMPUTATION (cont'd)							
14. 36 - 19 = (open-ended)	95.0	91.6*	93.4	94.8	89.7*	95.2	93.2
15. \$3.06 + 10.00 + 9.14 + 5.10 = (open-ended)	94.0	92.5	93.9	93.1	89.7*	94.7	94.9
17. 125 ÷ 5 = (open-ended)	94.7	93.2	95.0	94.4	92.2	94.9	94.0
24. If 23.8 is subtracted from 62.1 (open-ended)	84.4	78.0*	80.0*	82.4	76.9*	86.0	79.2*
26. 1054 - 865 = (open-ended)	92.3	88.8*	90.3	91.4	87.0*	93.1	90.5*
MEASUREMENT							
40. 1½ pounds = ___ ounces (open-ended)[a]	74.2	83.1*	84.5*	81.4	85.2*	68.7	81.2*

TABLE 5.3 (continued)

Description of Item	All 17-Year-Olds			Males		Females	
	Connecticut	NAEP National	NAEP Northeast	Connecticut	NAEP National	Connecticut	NAEP National
CHARTS AND GRAPHS							
11. Reading a table of sock sizes[a]	93.7	85.9*	86.4*	93.1	83.7*	94.1	88.1*
13. Reading a bar graph (open-ended)[a]	90.8	97.4*	97.2*	93.3	97.8*	88.8	97.0*
PROBLEM SOLVING							
8. Several people received votes; what percentage of total vote did one of the people receive? (open-ended)	45.7	44.5	47.9	58.8	53.4	36.4	36.0
16. Three people earned money. What was the average amount earned? (open-ended)	72.3	66.0*	76.6*	76.4	67.4*	69.2	64.6
27. If 300 calories in 9 ounces of a food, how many calories in 3 ounces? (open-ended)	79.1	70.0*	74.1*	81.5	74.2*	77.4	66.4*

TABLE 5.3 (continued)

Description of Item	All 17-Year-Olds			Males		Females	
	Connecticut	NAEP National	NAEP Northeast	Connecticut	NAEP National	Connecticut	NAEP National
PROBLEM SOLVING (cont'd)							
39. How much more would a person pay to buy a certain car on credit than by paying cash? (open-ended)	56.9	55.8	61.8	60.2	55.4	54.5	56.1
41. Parking lot charges 35¢ first hour, 25¢ each additional hour or fraction. What is the cost to park from 10:45 A.M. to 3:05 P.M.? (open-ended)	54.3	46.7*	53.1	57.6	49.2*	51.8	44.1*
43. Person left for work at 7:45 A.M. and returned home 10 hours later at what time? (open-ended)	86.5	82.4*	87.1	89.3	84.5*	84.4	80.4*

TABLE 5.3 (continued)

Description of Item	All 17-Year-Olds			Males		Females	
	Connecticut	NAEP National	NAEP Northeast	Connecticut	NAEP National	Connecticut	NAEP National
GEOMETRY							
5. Degrees of angle formed by hands of clock at 3 o'clock (open-ended)	71.7	72.8	83.1	77.6	76.6	67.4	69.0
23. Height of tent pole (use of right triangle) (open-ended)	39.0	33.8*	40.3	47.1	38.5*	32.9	29.1
42. Degrees of third angle of triangle (open-ended)	51.8	51.5	62.9*	55.3	54.3	49.2	49.0

Computation. The total group of Connecticut 17-year-olds performed significantly better than 17-year-olds nationally on three of the seven NAEP Computation items, and significantly better than the Northeast on one of these items. Comparisons by sex show that Connecticut 17-year-old males performed significantly better than 17-year-old males nationally on four of the seven NAEP items, while Connecticut females performed better than females nationally on two of the seven items. All other comparisons show that Connecticut 17-year-olds performed equally as well as the NAEP groups.

Measurement. On the one NAEP item for this goal, all Connecticut reporting groups scored significantly lower than their national and their Northeast counterparts.

Charts and Graphs. There were two NAEP items for this goal area. On one of these items, all comparisons show that Connecticut reporting groups performed significantly better than their national and Northeast counterparts. However, on the other NAEP item (Item 13—an open-ended item requiring students to read a bar graph), Connecticut 17-year-olds performed significantly less well than national and Northeast 17-year-olds in all comparisons.

Problem Solving. The total group of Connecticut 17-year-old students performed significantly better than 17-year-olds nationally on four of the six Problem Solving items, and significantly better than Northeast 17-year-olds on one of the six items. On all remaining items with one exception, the total group of Connecticut 17-year-olds scored about the same as their national counterparts. The exception was Item 16, on which the Connecticut 17-year-olds scored significantly lower than did Northeast 17-year-olds. Comparisons by sex show that Connecticut 17-year-old males performed significantly better than their national counterparts on four of the six items, and Connecticut 17-year-old females did so on three of the six items.

Geometry. There were three NAEP items for this goal area. On one of these items (Item 5), all Connecticut reporting groups did not score significantly differently from their national and Northeast counterparts. On the remaining two items, the only significant differences were on Item 23, where the total group of Connecticut 17-year-olds outperformed their national counterparts, as did Connecticut males, and on Item 42, where the total group of Connecticut students performed less well than 17-year-olds in the Northeast region.

Summary

There were a total of 14 items for 9-year-olds, 20 for 13-year-olds, and 23 for 17-year-olds that were identical on both the NAEP and CAEP tests.

Tables 5.4, 5.5, and 5.6 show the average percentage of these test items answered correctly in each goal area by students in Connecticut, the nation, and the Northeast at the three respective levels. Table 5.7 shows the percentage of those NAEP items on which each Connecticut age

TABLE 5.4

Graph of 9-Year-Olds' Performance by Goal Area:
Connecticut, the Nation, and the Northeast

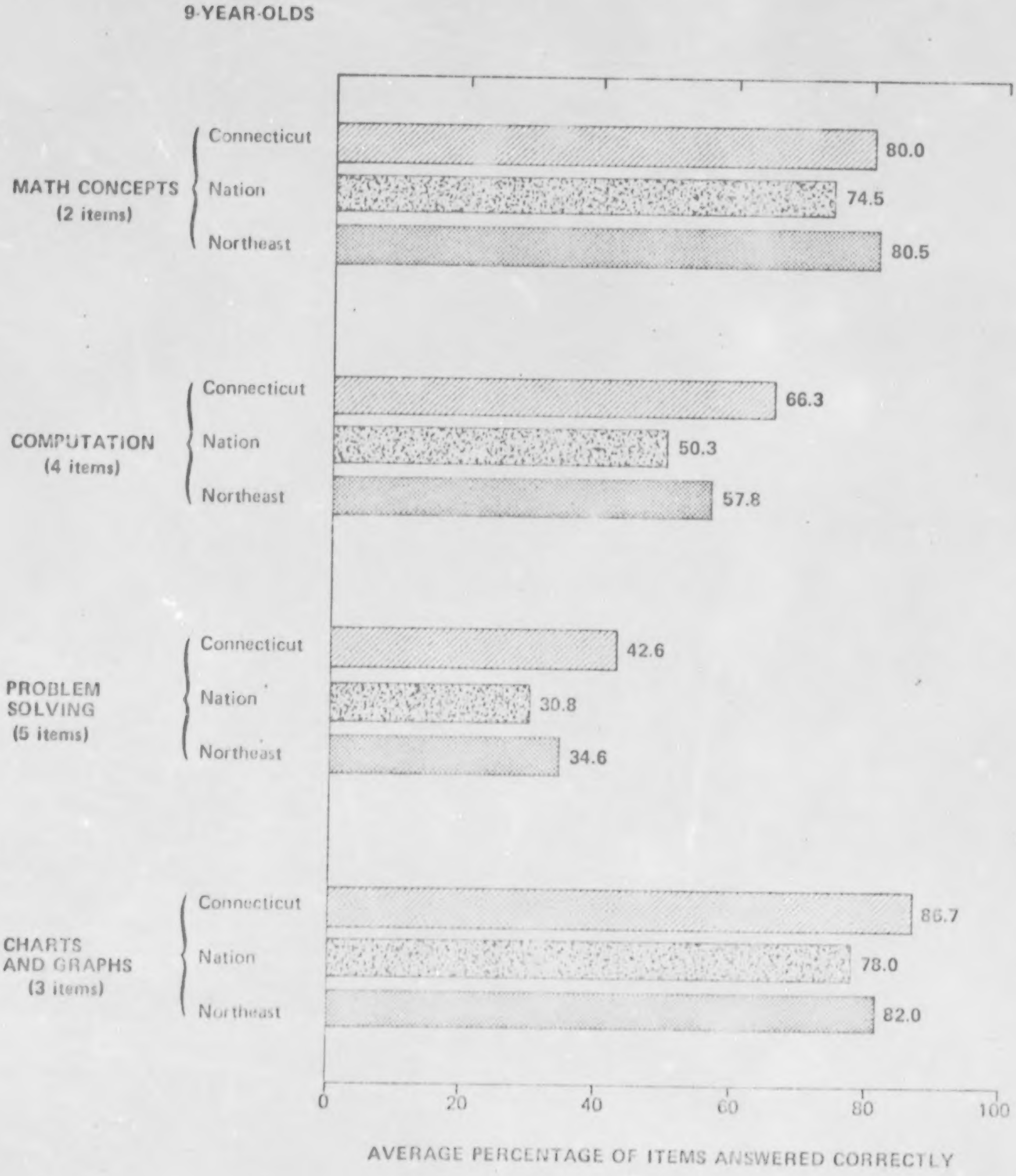


TABLE 5.5

Graph of 13-Year-Olds' Performance by Goal Area: Connecticut, the Nation, and the Northeast

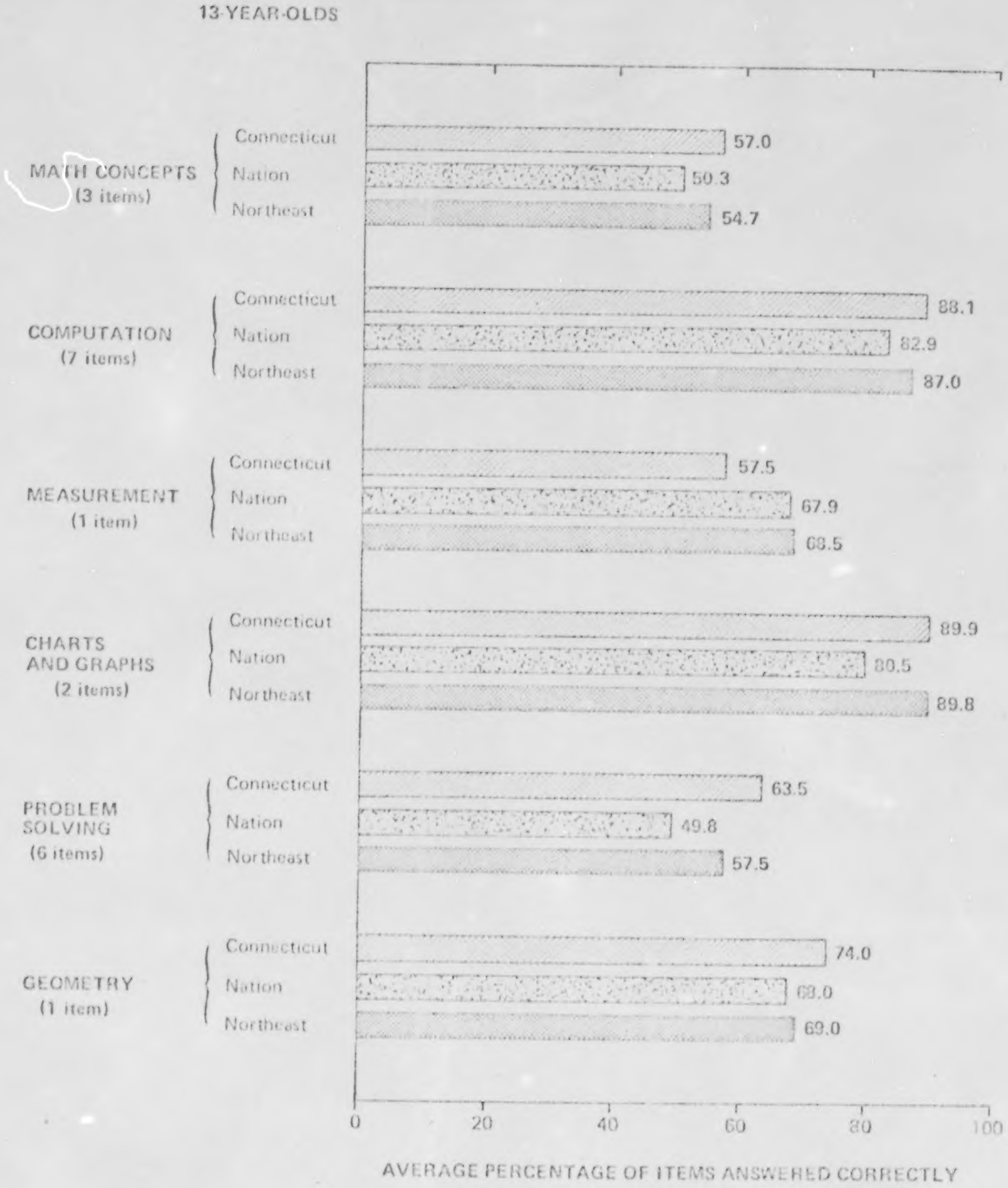


TABLE 5.6

Graph of 17-Year-Olds' Performance by Goal Area: Connecticut, the Nation, and the Northeast

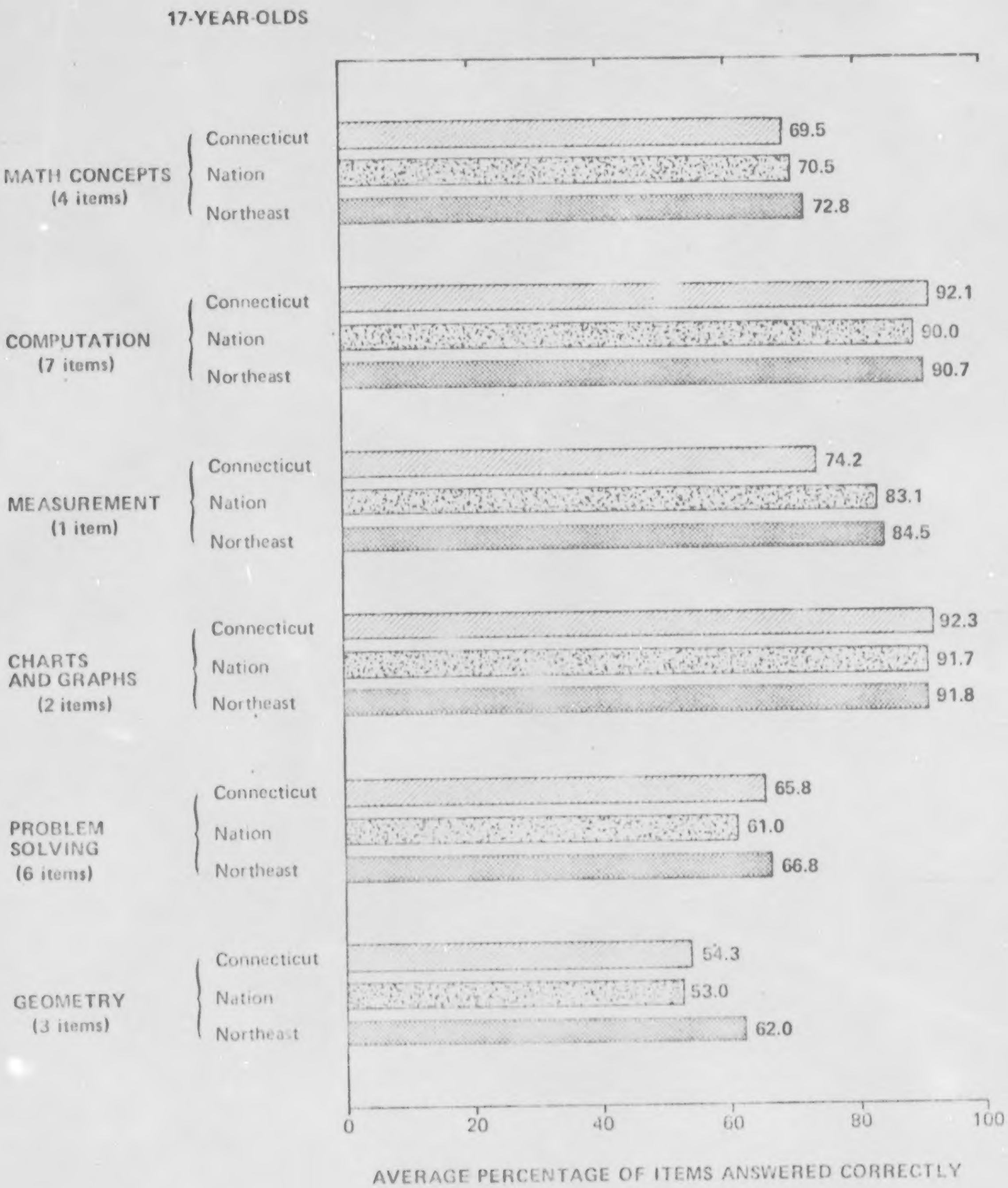
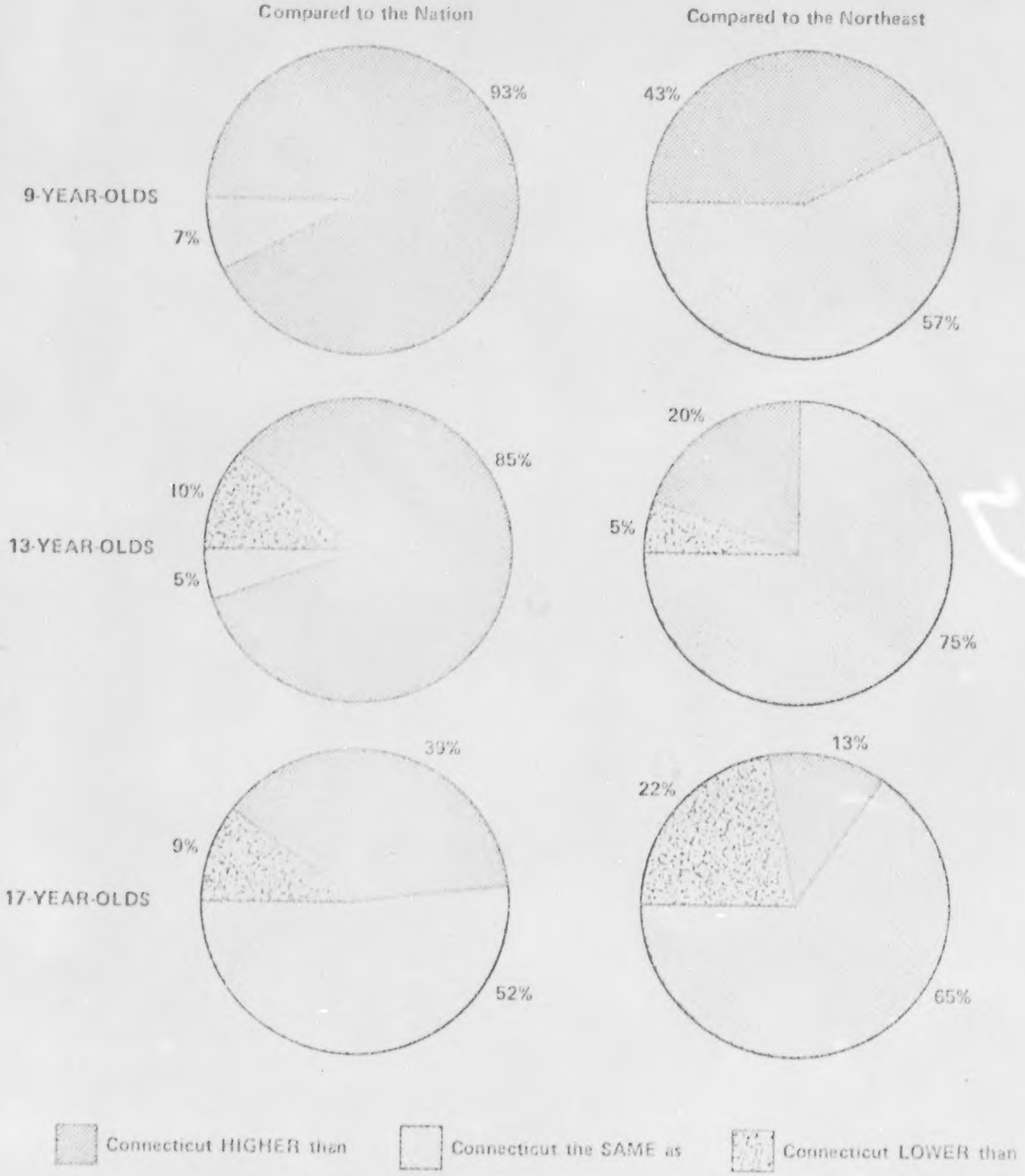


TABLE 5.7

Summary Graphs of Connecticut 9-, 13-, and 17-Year-Olds' Performance Relative to the Nation and the Northeast



group scored higher, lower, and not significantly different than the nation and the Northeast. The Northeast region is defined by NAEP as including Maine, New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island, New York, New Jersey, Washington, D.C., Pennsylvania, and Maryland.

Comparisons with the nation. On *none* of these test items did Connecticut 9-year-olds score significantly lower than their national counterparts. Both Connecticut 13- and 17-year-olds performed significantly lower on only two items relative to students nationally.

Connecticut 9- and 13-year-olds scored significantly above the nation on almost all items, while Connecticut 17-year-olds achieved more highly than the nation on 39% of the items administered to them.

In terms of the average percentage of test items answered correctly, Connecticut 9-year-olds substantially outscored their national counterparts in all goal areas. For this Connecticut age group, the largest difference from the national average was in Computation (16%) and the smallest difference was in Mathematical Concepts (5.5%).

Connecticut 13-year-olds also outscored their national counterparts (by 5-13%) in all goal areas, with one exception. In Measurement, Connecticut 13-year-olds scored lower than the nation by approximately 10%. By contrast, Connecticut 17-year-olds scored above the nation on only four of the six goal areas, and then only by a small margin.

Comparisons with the Northeast. Connecticut 9-year-olds scored lower than the Northeast region on *none* of the test items, while 13-year-olds scored lower on 5% (one of the test items) and 17-year-olds scored lower on 22% (five of the test items) than their Northeast counterparts. Of the three Connecticut age groups, 9-year-olds showed the best comparative performance, scoring higher than their Northeast counterparts on 43% of the items. Connecticut 13-year-olds scored higher than the Northeast on 20% of the items, and Connecticut 17-year-olds on 13% (a total of three items).

The average achievement of Connecticut 9-year-old students was higher than that of their Northeast counterparts on three of the four goal areas. Nine-year-olds performed about the same as Northeast students on Mathematical Concepts. Connecticut 13-year-olds scored above the Northeast region on Measurement and the same as the Northeast on Computation and Charts and Graphs. Connecticut 17-year-olds showed lower average achievement than Northeast students on Mathematical Concepts, Measurement, and Geometry, and quite similar achievement on Computation, Charts and Graphs, and Problem Solving.

Overview. In general, the relative performance of the Connecticut 9- and 13-year-olds was stronger than that of the Connecticut 17-year-olds. However, the achievement of all three Connecticut age groups was better in comparison to the nation than in comparison to the Northeast.

CHAPTER 6

RESULTS OF THE STUDENT QUESTIONNAIRE

Introduction

The purpose of this chapter is to summarize the responses of 9-, 13-, and 17-year-old Connecticut students to each item on the student questionnaires. One questionnaire was developed for each age group, with several questions duplicated across questionnaires. The purpose of administering these questionnaires was to identify factors about students and their home and school lives that might be related to achievement. Results on the relationships that were observed are presented in Chapter 4.

These summaries of questionnaire responses are provided for all students within each grade and for students in each region and in each size of community. The data reported are the percentages of students in each group selecting each response to each questionnaire item.

The data summaries are presented in Table 6.1 for 9-year-olds, in Table 6.2 for 13-year-Olds, and in Table 6.3 for 17-year-olds. The narrative that accompanies the tables highlights these results. The narrative is organized by questionnaire item and presents for each one a summary of *all* students at a given age level as well as highlights of the differences between regions and communities of different sizes. For each questionnaire item, the discussion focuses first on 9-year-olds, and subsequently on 13- and 17-year-olds respectively.

TABLE 6.1

Responses of 9-Year-Old Students to Questionnaire Items, Crosstabulated by Region and Size of Community, and Reported in Percentages

	Total	Size of Community				Region					
		Big Cities	Fringe Cities	Medium Cities	Smaller Places	1	2	3	4	5	6
SEX											
Male	46.8	44.4	46.3	46.7	48.5	48.2	48.2	44.1	50.5	46.2	54.2
Female	53.2	55.6	53.7	53.3	51.5	51.8	51.8	55.9	49.5	53.8	45.8
TALK TO PARENTS ABOUT SCHOOL?											
Never	12.6	14.7	10.3	11.9	13.7	15.3	9.6	10.9	12.1	13.2	19.4
Monthly	5.1	3.8	5.2	4.9	6.0	6.1	4.2	6.5	5.2	3.9	6.9
Weekly	22.8	17.8	23.4	23.1	24.6	24.8	25.2	20.5	23.8	26.1	31.9
Daily	59.5	63.7	61.1	60.2	55.7	53.8	61.0	62.0	58.9	56.8	41.7
PARENTS HELP WITH SCHOOLWORK?											
Yes	72.1	71.4	71.3	76.8	69.5	69.4	64.4	73.4	82.3	68.1	70.8
No	27.9	28.6	28.7	23.2	30.5	30.6	35.6	26.6	17.7	31.9	29.2
HOURS PER DAY WATCHING TV?											
Less than 1 hour	5.9	6.5	6.3	5.8	5.3	8.8	5.1	6.4	3.9	4.6	6.9
1-2 hours	14.2	10.3	18.3	13.0	14.5	16.4	17.8	14.5	14.1	14.7	11.1
2-3 hours	18.9	14.0	20.9	16.6	21.9	18.9	21.5	21.8	18.5	19.6	11.1
3-4 hours	19.8	12.8	18.9	21.3	23.0	24.4	19.2	18.0	22.9	24.9	26.4
More than 4 hours	41.2	56.4	35.7	43.3	35.4	31.5	36.4	39.2	40.6	36.2	44.4
LIKE SCHOOL?											
Hate it	5.8	6.1	3.5	5.4	7.6	4.9	5.6	5.1	7.2	7.1	2.8
Don't like it	5.4	4.4	4.3	5.2	6.9	5.8	3.6	5.9	4.7	8.5	5.6
It's O.K.	36.4	32.5	41.0	32.5	33.2	36.4	35.4	32.4	40.2	40.7	54.2
Pretty much	17.7	12.2	21.8	16.3	18.7	22.2	22.1	21.0	15.0	14.7	13.9
Like it a lot	34.7	44.9	29.4	40.7	23.5	30.8	33.2	35.6	32.9	29.0	23.6

TABLE 6.1 (continued)

	Total	Size of Community				Region					
		Big Cities	Fringe Cities	Medium Cities	Smaller Places	1	2	3	4	5	6
LIKE MATH											
Not at all	9.6	10.1	7.9	9.3	10.8	10.8	11.9	8.6	10.1	7.0	11.1
Somewhat	39.0	30.0	42.8	31.5	46.6	48.3	41.9	39.8	37.2	38.2	51.4
Very much	51.4	59.9	49.3	59.2	42.5	40.9	46.2	51.6	52.8	54.8	37.5
FIND MATH USEFUL COMPARED TO OTHER SUBJECTS											
Not very useful	5.0	7.6	3.9	3.8	5.3	4.6	3.7	6.2	3.6	2.8	4.2
Somewhat useful	29.4	19.6	31.6	25.2	36.0	25.9	26.0	33.3	29.5	36.8	42.3
Very useful	65.6	72.8	64.5	70.9	58.7	69.5	70.3	60.5	66.9	60.4	53.5

TABLE 6.2

Responses of 13-Year-Old Students to Questionnaire Items, Crosstabulated by Region and Size of Community, and Reported in Percentages

	Total	Size of Community				Region					
		Big Cities	Fringe Cities	Medium Cities	Smaller Places	1	2	3	4	5	6
SEX											
Male	46.0	45.0	43.4	46.3	48.3	47.9	42.2	50.7	42.0	48.1	38.
Female	54.0	55.0	56.6	53.7	51.7	52.1	57.8	49.3	58.0	51.9	61.
TALK TO PARENTS ABOUT SCHOOL?											
Never	6.3	7.6	4.6	7.9	5.8	5.6	5.0	5.9	6.1	8.0	6.
Monthly	9.4	9.7	8.3	8.8	10.4	11.7	5.0	9.5	11.8	8.1	13.
Weekly	29.5	26.3	30.7	32.8	27.8	26.7	32.7	31.2	30.2	26.3	29.
Daily	54.9	56.4	56.4	50.6	56.0	56.0	57.4	53.4	51.9	57.6	50.
PARENTS ENCOURAGE SCHOOLWORK?											
Hardly at all	2.9	4.2	2.7	2.6	2.6	2.1	3.0	2.3	2.3	2.9	4.
Only a little	15.7	14.3	14.1	15.9	17.3	18.5	11.9	18.3	13.7	16.2	17.
Quite a bit	46.7	45.3	44.4	44.2	50.6	46.5	47.3	46.9	46.3	49.4	41.
A lot	34.8	36.2	38.9	37.2	29.6	32.9	37.8	32.5	37.7	31.5	35.
HOURS PER DAY WATCHING TV?											
Less than 1 hour	5.9	2.1	5.6	8.6	6.0	7.9	13.2	5.1	3.7	5.4	3.0
1-2 hours	16.7	11.5	17.1	16.9	18.6	20.1	18.9	17.1	17.0	16.0	13.
2-3 hours	24.8	19.1	25.9	24.5	26.8	26.0	28.0	26.3	23.6	25.2	31.
3-4 hours	27.1	28.1	26.5	26.8	27.4	27.6	26.0	26.3	30.1	23.5	31.3
More than 4 hours	25.4	39.2	24.8	23.2	21.1	18.3	13.9	25.2	25.6	29.9	20.9

TABLE 6.2 (continued)

	Total	Size of Community				Region					
		Big Cities	Fringe Cities	Medium Cities	Smaller Places	1	2	3	4	5	6
LIKE SCHOOL?											
Hate it	4.8	4.8	5.2	3.3	5.5	2.2	3.6	4.1	5.3	6.0	14.9
Don't like it	8.5	8.1	6.0	9.4	9.9	8.0	7.4	10.4	7.8	8.1	7.5
It's O.K.	46.5	46.6	49.3	42.6	46.9	47.7	36.3	50.7	48.6	45.3	49.3
Pretty much	29.0	26.9	29.2	30.2	29.0	30.5	35.9	27.7	25.7	31.7	20.9
Like it a lot	11.2	13.6	10.4	14.4	8.6	11.6	16.8	7.1	12.5	9.1	7.5
LIKE MATH?											
Not at all	13.1	9.0	16.4	14.9	11.4	12.4	16.5	15.3	13.9	8.3	14.9
Somewhat	58.1	54.6	59.5	59.6	57.8	58.0	63.1	56.1	60.0	57.2	61.2
Very much	28.7	36.5	24.1	25.5	30.8	29.6	20.4	28.6	26.1	34.5	23.9
FIND MATH USEFUL COMPARED TO OTHER SUBJECTS?											
Not very useful	3.8	3.4	3.4	4.5	3.8	2.0	5.5	3.6	3.1	4.4	6.0
Somewhat useful	44.1	39.0	45.7	47.9	42.5	44.6	49.2	45.3	44.8	42.5	35.8
Very useful	52.1	57.5	50.9	47.5	53.6	53.4	45.4	51.1	52.2	53.1	58.2

TABLE 6.3

Responses of 17-Year-Old Students to Questionnaire Items, Crosstabulated by Region and Size of Community, and Reported in Percentages

	Total	Size of Community				Region					
		Big Cities	Fringe Cities	Medium Cities	Smaller Places	1	2	3	4	5	6
SEX											
Male	43.5	40.9	44.1	44.0	43.6	42.6	43.7	44.5	43.2	44.8	43.1
Female	56.5	59.1	55.9	56.0	56.4	57.4	56.3	55.5	56.8	55.2	56.9
PARENTS ENCOURAGE SCHOOLWORK?											
Hardly at all	4.6	6.3	4.1	4.2	4.5	3.5	3.4	4.7	3.4	6.2	6.2
Only a little	21.5	16.9	21.6	21.6	23.1	20.8	19.6	24.1	21.9	21.6	26.2
Quite a bit	46.0	40.1	44.9	48.7	47.0	49.4	48.8	47.1	43.9	48.4	38.5
A lot	28.0	36.7	29.4	25.5	25.4	26.2	28.3	24.1	30.8	23.8	29.2
HOURS PER DAY WATCHING TV?											
Less than 1 hour	22.3	15.5	25.4	22.1	22.7	23.7	28.0	25.7	17.0	20.1	21.5
1-2 hours	29.8	26.2	29.1	26.0	34.7	32.7	29.3	31.3	29.3	31.4	23.1
2-3 hours	22.5	19.2	22.1	28.5	19.5	24.1	22.8	21.9	26.0	23.2	16.9
3-4 hours	14.9	21.4	13.6	13.1	14.6	12.7	11.3	12.4	16.1	15.6	24.5
More than 4 hours	10.5	17.7	9.8	10.2	8.5	6.7	8.6	8.8	11.6	9.7	13.8
LIKE SCHOOL?											
Hate it	4.9	2.9	5.8	3.5	6.2	7.5	6.1	3.9	6.0	4.6	4.6
Don't like it	11.0	10.3	11.8	9.8	11.6	10.7	11.5	10.4	10.6	15.1	4.6
It's O.K.	42.3	44.2	39.1	42.6	43.8	38.6	34.9	42.3	45.6	45.4	46.2
Pretty much	31.0	28.4	33.2	33.4	28.6	29.3	34.9	33.8	29.1	26.5	29.2
Like it a lot	10.8	14.2	10.2	10.7	9.9	13.9	12.8	9.1	7.8	8.4	15.4
LIKE MATH?											
Not at all	22.9	21.2	25.4	20.3	23.7	19.2	25.4	23.3	23.3	23.4	20.0
Somewhat	55.8	49.5	57.4	59.2	54.4	60.3	56.5	56.3	55.7	55.3	63.1
Very much	21.3	29.3	17.3	20.5	21.8	20.5	18.1	20.4	21.0	21.3	16.9

TABLE 6.3 (continued)

	Total	Size of Community				Region					
		Big Cities	Fringe Cities	Medium Cities	Smaller Places	1	2	3	4	5	6
FIND MATH USEFUL COMPARED TO OTHER SUBJECTS?											
Not very useful	9.0	8.0	12.7	7.9	7.4	8.5	11.7	9.1	10.2	5.8	4.6
Somewhat useful	55.9	50.4	55.5	54.8	59.3	59.2	52.6	59.0	56.4	56.4	56.9
Very useful	35.1	41.7	31.8	37.3	33.3	32.3	35.7	32.0	33.4	37.8	38.5
FIND MATH USEFUL OUTSIDE OF SCHOOL?											
Not very useful	30.0	24.2	35.1	28.9	29.4	37.1	37.7	28.9	29.1	28.4	16.9
Somewhat useful	51.0	47.6	47.7	52.3	53.9	47.3	48.4	55.0	48.8	51.3	63.1
Very useful	19.0	28.3	17.1	18.8	16.8	15.5	13.9	16.1	22.1	20.3	20.0
YEARS OF MATH?											
None	0.3	0.5	0	0.9	0.1	0.4	0.7	0.2	0.2	0	0
1 year	6.8	7.2	5.1	5.4	9.0	6.2	2.5	9.8	6.2	5.2	10.8
2 years	23.7	30.6	22.0	22.5	23.2	23.7	17.4	24.7	25.3	22.4	16.9
3 years	69.2	61.7	72.9	71.2	67.7	69.6	79.4	65.3	68.3	72.4	72.3
SCHOOL ASPIRATIONS?											
Not finish high school	0.2	0.2	0.2	0.2	0.2	0	0.6	0.3	0	0	0
Graduate high school	13.4	14.5	9.8	14.0	15.4	13.3	6.8	12.5	17.5	14.7	25.2
Vocational school	19.3	23.4	19.2	18.4	19.9	18.5	16.7	18.4	23.7	21.7	10.8
2-year college	12.7	13.5	11.5	13.3	12.9	14.9	7.8	14.0	11.2	15.2	16.9
4-year college	38.0	34.1	40.9	39.1	36.4	37.5	45.4	40.7	34.1	35.2	24.6
Graduate school	15.8	14.3	18.3	14.9	15.3	15.8	22.7	14.1	13.5	13.4	21.5

When interpreting the differences between regions, the reader is cautioned to bear in mind that the "big cities" have been extracted from their respective regions. That is, the responses of students from "big cities" within Region 3, for example, are not included in the summaries for that region. Responses of students from "big cities" are treated separately in that category of size of community. The reader is directed to Chapter 1 for definitions of the region and size of community categories.

Sex of Student

A slightly higher percentage of females than males at each of the three age levels participated in the assessment (approximately 54% versus 46%), with the percentage of females increasing slightly as the age level increases.

At the 9-year-old level the distributions by community size and region were similar to those for the age level as a whole, with the exception of Region 6, where the pattern was reversed (about 54% males and 46% females).

At the 13-year-old level the distributions by community size and region were similar to the distribution found for all 13-year-olds, again with the exception of Region 6, where approximately 61% of the students assessed were female.

At the 17-year-old level the distributions by community size and region were similar to the distribution for all 17-year-olds with the exception of "big cities," where approximately 59% of the students assessed were female.

Discussion of School with Parents

Nine- and 13-year-olds were asked whether they discussed schoolwork and experiences with adults in their homes "daily," "weekly," "monthly," or "hardly ever or never."

Summary by age level. More than half of the students at each age level discuss schoolwork daily, with a slightly higher percentage of 9-year-olds (59.5%) than 13-year-olds (54.9%) in this category. Less than 18% at either age level have only monthly or less frequent discussions of school with adults at home.

Differences by region and community size. At the 9-year-old level, the distributions of responses by community size were similar to the distribution found for the age level as a whole. The big cities display the most striking contrasts, reporting the highest percentage of 9-year-olds rarely or never discussing schoolwork (14.7%) *and* the largest percentage of 9-year-olds discussing schoolwork daily (63.7%). The distributions of responses by region were also quite similar to the overall distribution for 9-year-olds, with the exception of Region 6, which reported the *highest* percentage of 9-year-olds who rarely or never discuss school (19.4%) and the *lowest* percentage of daily discussants (41.7%).

At the 13-year-old level, the distributions of responses according to region and size of community were essentially similar to the distribution for all 13-year-olds. In every region and in every size community slightly more than half of the 13-year-olds have daily discussions about school and 25-30% have weekly discussions.

Parental Encouragement

Thirteen- and 17-year-olds were asked whether their parents gave them encouragement in their schoolwork "a lot," "quite a bit," "only a little," or "hardly at all."

Summary by age level. Approximately 46% at each age level receive "quite a bit" of encouragement from parents. However, a higher percentage of 17-year-olds than 13-year-olds receive "only a little" or "hardly any" encouragement (26.1% versus 18.3%); less than 5% at either age level get "hardly any" encouragement.

Differences by region and community size. At the 13- and 17-year-old levels the distributions of responses by region were quite similar to the distribution found in the respective age levels as a whole.

Parental Assistance with Schoolwork

Nine-year-old students were asked whether their parents usually help them with schoolwork.

Approximately 72% of all 9-year-olds said that their parents usually help them.

The distributions of responses by community size reveal that a slightly higher percentage of students in medium-sized cities (76.8%) and a slightly lower percentage of students in smaller communities (69.5%) obtain parental assistance as compared with 9-year-olds overall.

The distributions of responses by region reveal that Region 2 has a somewhat lower percentage of students receiving help from parents (64.4%) and Region 4 has a somewhat higher percentage receiving help (82.3%) than 9-year-olds across the state in general.

Television-Watching

Students at all three age levels were asked how many hours they watch television daily.

Summary by age level. In general, television-watching declines at the higher age levels. Thus, whereas about 40% of the 9-year-olds watch more than four hours of TV a day, only about 25% of the 13-year-olds and 10% of the 17-year-olds watch television this much. Conversely, a little over half of the 17-year-olds watch two hours or less each day, whereas only about 22% of the 13-year-olds and 20% of the 9-year-olds restrict their viewing to this extent.

Differences by region and community size. At the 9-year-old level, the basic pattern of responses across students in different community sizes was the same, with the largest group in each size of community watching television more than four hours daily. However, the big cities had the largest percentage of students in this category (56.4%) and the small communities had the smallest percentage (35.4%). However, there is considerably less variation between different-sized communities in terms of the percentages of students who watch three or more hours of television daily (ranging from 58.4% in smaller places to 69.2% in big cities). The distributions of responses by region were quite similar to the overall pattern among 9-year-olds, although Region 1 had a somewhat similar percentage of students watching more than four hours daily (31.5%) than in the total sample.

At the 13-year-old level, the distributions of responses by community size were similar to that for 13-year-olds statewide, with the exception of the percentage of big-city students, who watch more than four hours daily (39.2% versus 25.4% in the total sample). The distributions of responses by region fairly consistently resembled the distribution for 13-year-olds statewide. However, 13-year-olds in Regions 1 and 2 watch television slightly less often than the students in other regions.

At the 17-year-old level, students in big cities watch television somewhat more often than students statewide. The distributions of 17-year-olds' responses in communities of other sizes were similar to the statewide distribution. The distributions of responses by region reveal that a considerably higher percentage of 17-year-olds in Region 6 watch three or more hours of television daily than in the other regions, where the distributions were generally similar to the statewide distribution.

Feelings About School

Students in all three age groups were asked to select a description of their feelings about school. Descriptors ranged from "I hate it" to "I like it a lot."

Summary by age level. In general, the pattern of responses selected by 9-year-olds differed from the pattern found at the 13- and 17-year-old levels, although in all three age groups only about 5% of the students "hate" school. However, a considerably lower percentage of 13- and 17-year-olds than 9-year-olds like school "a lot" (about 10% versus about 35%), and a somewhat higher percentage of 13- and 17-year-olds than 9-year-olds like school "pretty much" (about 30% versus about 18%).

Differences by region and community size. At the 9-year-old level, there were generally few differences in response patterns of students in communities of different sizes. Relatively few students in any type of community "don't like" or "hate" school. However, somewhat higher percentages of students in big cities and medium-sized cities like school "pretty much" or "a lot" (about 57% in each case) than in fringe cities and smaller areas (51.2% and 47.2%, respectively). The distributions by region reveal that a higher percentage of Region 5 9-year-olds "don't like" or "hate" school (15.6%) than in other regions, where about 10% fall into these categories. A little over half of Region 1, 2, and 3 students like school "pretty much" or "a lot," a little under half of Region 4 students fall in these categories, and about 40% of Region 5 and 6 students fall into these categories.

At the 13-year-old level, all of the distributions of responses by size of community are essentially similar to the statewide pattern. The distributions by region, however, reveal that a somewhat larger percentage of Region 2 13-year-olds have positive feelings about school than students in other regions, and a somewhat larger percentage of Region 6 students have negative feelings about school than students in other regions.

At the 17-year-old level, all of the distributions of responses by size of community and region are essentially similar to the pattern found in the state as a whole.

Feelings About Mathematics

Students at all three age levels were asked whether they like mathematics "very much," "somewhat," or "not at all."

Summary by age level. In general, the appeal of mathematics declines as age increases, although the pattern of responses selected by 13- and 17-year-olds resembled one another more than either resembled the pattern of 9-year-olds. Slightly more than half of the 9-year-old students like mathematics "very much" as compared to only 28.7% of 13-year-olds and 21.3% of 17-year-olds who selected this response. Similarly, only 9.6% of the 9-year-olds do not like mathematics at all, whereas 13% of the 13-year-olds and 22.9% of the 17-year-olds feel this way.

Differences by region and community size. At the 9-year-old level, the big cities and medium-sized cities have somewhat higher percentages of students who like mathematics "very much" (about 50% in each), and small communities have the lowest percentage of students in this category (42.5%). The distribution by region reveals that slightly more than half of the 9-year-olds in Regions 3, 4, and 5 like mathematics "very much," whereas only about 40% in Regions 1 and 6 have this strong positive feeling.

At the 13-year-old level, the distribution of responses by community size reveals that fringe-city students have more negative attitudes toward mathematics than students in other areas, whereas the big cities show the highest percentage of students who like mathematics "very much" (36.5%). The distribution by region reveals that Regions 2 and 3 have the highest percentages of students who do not like mathematics at all (15.3% and 16.5%, respectively), and Region 5 had the highest percentage of students who like mathematics "very much" (34.5%).

At the 17-year-old level, the distributions of responses by community size were generally similar to the statewide pattern. However, there was a considerable difference between the percentage of big-city students who like mathematics "very much" (29.3%) and the percentage of fringe-city students in this category (17.3%). In general, the distributions of 17-year-olds' responses by region were the same as the distribution in the state as a whole.

Usefulness of Mathematics Compared to Other Subjects

Students at all three age levels were asked to describe how useful they felt mathematics was in comparison to other subjects they study in school ("very useful," "somewhat useful," or "not very useful").

Summary by age level. The percentage of students who find mathematics "very useful" in comparison to their other subjects declines as age level increases, with almost two-thirds of the 9-year-olds, slightly over half of the 13-year-olds, and only a little over one-third of the 17-year-olds selecting this response. However, the percentage of students who find mathematics "somewhat useful" increases with age, ranging from about 30% of the 9-year-olds to about 56% of the 17-year-olds. Relatively few at any age level find mathematics of little usefulness.

Differences by region and community size. At the 9-year-old level, the distributions of responses by community size and region were generally similar to the statewide distribution, with the exception that a somewhat lower percentage of Region 6 students find mathematics very useful (53.5%).

In general, at the 13-year-old level the distributions of responses by community size resembled the statewide pattern, with the exception that 57.5% of the big-city students find mathematics "very useful" and only 47.5% of the medium-city students fall into this category. Distributions by region also generally resembled the overall distribution, with the exception that 58.2% of Region 6 students and only 45.4% of Region 2 students find mathematics "very useful."

Among 17-year-olds, the distribution of responses both by community size and region were approximately the same as the statewide pattern.

Usefulness of Mathematics Outside of School

Seventeen-year-old students were also asked whether they find the mathematics they study in school useful outside of school. Although 51% find mathematics "somewhat useful" in extracurricular life, a somewhat larger percentage find it "not very useful" (30%) than find it "very useful" (19%).

Differences by region and community size. The percentages of 17-year-olds across communities of different sizes who find mathematics "somewhat useful" outside of school are approximately the same as the percentage statewide (about 50%). However, a somewhat larger percentage of students in big cities find mathematics "very useful" (28.3%) than in other-sized communities, and a somewhat larger percentage of students in fringe cities find mathematics "not very useful" (35.1%) in comparison to students in other-sized communities.

The distributions of responses by region reveal that a somewhat larger percentage of students in Regions 1 and 2 find mathematics "not very useful" in comparison to other regions, and a somewhat larger percentage of students in Region 6 find mathematics "somewhat useful" in comparison to other regions and the total sample. Otherwise, the pattern of responses by region is similar to the statewide pattern.

Years of Mathematics

Seventeen-year-olds were asked how many years of mathematics education they have had in ninth, tenth, and eleventh grade. Approximately 69% have had three years, 24% have had two years, 7% have had one year, and less than 1% have not studied mathematics in these three grades.

Differences by region and community size. A similar pattern appeared in communities of different sizes, although slightly lower percentages of students in big cities and small communities have studied mathematics for three years in comparison to students statewide. The pattern across all regions was generally similar to that statewide, although more Region 2 students (almost 80%) have had three years of mathematics, and more Region 3 and 6 students (about 10%) have had only one year of mathematics.

Educational Aspirations

Seventeen-year-olds were asked to describe their aspirations for future schooling. Responses ranged from "not finish high school" to "attend graduate or professional school." Among all 17-year-olds, the largest group aspires to a four-year college education (38%), followed by about 20% who wish to complete a vocational or business school. Almost everyone plans to finish high school, and only about 13% plan only to graduate from high school.

Differences by region and community size. The distributions by community size reveal that fringe-city students have the highest expectations, with almost 60% planning to attend four or more years of college (compared to about 54% of students statewide). Big cities had the smallest percentage of students in these combined categories (48.4%) and the largest percentage aspiring to a vocational school education (23.4%). In general, however, there were no striking differences across communities of different sizes.

The distributions by region reveal that in all regions, either a sizeable plurality or a majority aspire to four or more years of college, ranging from 46.1% of Region 6 students to 68.1% of Region 2 students in this category. Region 6 had a somewhat higher percentage of students who seek only a high school education (26.2%) than other regions, but this region also had the second highest percentage of students who aspire to graduate or professional school (21.5%).

Summary

Student home measures.

- Roughly 80% of 9- and 13-year-olds have at least weekly discussions with their parents about school.
- At least three-quarters of 13- and 17-year-olds receive "quite a bit" or "a lot" of parental encouragement about school.
- Approximately 72% of 9-year-olds obtain parental assistance with schoolwork.

- Television viewing declines with age, but big-city children at all three age levels tend to watch more television than students in communities of other sizes.

Student school measures.

- As students get older, they report less positive feelings about school, although a plurality at each of the three age levels think school is "O.K."
- The appeal of mathematics declines with age, although big-city students of all ages tend to like mathematics more than students in communities of other sizes.
- The perceived usefulness of mathematics in comparison to other subjects declines with age, although relatively few at any age level find it of minimal use.
- Approximately 80% of 17-year-olds find mathematics either somewhat or very useful outside of school.
- Sixty-nine percent of 17-year-olds have had three years of high school mathematics, and only 7% have had only one year.
- Almost all 17-year-olds plan to finish high school, and only about 13% plan to finish high school but pursue no further schooling. Fringe-city students have the highest aspirations, with about 60% (as compared to about 54% statewide) planning on four or more years of college.

CHAPTER 7

RESULTS OF THE PRINCIPAL QUESTIONNAIRE

Introduction

The purpose of the principal questionnaire administered to principals of all participating schools was to collect information on school variables that might prove to bear a relationship to achievement (see Chapter 4). However, the responses of the principals to the questionnaire items are interesting in and of themselves as a general characterization of the schools in which testing occurred.

The questionnaires for principals of 9-, 13-, and 17-year-old students were similar but not identical; therefore, data for all three age levels is not provided for all questionnaire items. The data is generally given as the percentage of principals for each age level selecting each response to each questionnaire item. These data are presented in Table 7.1, 7.2, and 7.3 for principals of 9-, 13-, and 17-year-olds, respectively. The tables display results for principals in the total sample and in each region and size of community.

Separate analyses were performed for the five open-ended questionnaire items that required principals to write in a response: (1) total school enrollment, (2) in-grade enrollment (fourth, eighth, or eleventh), (3) math class size, (4) number of instructional aides, and (5) hours of math per class per week. For these items, an average (mean) was computed for all

TABLE 7.1

Crosstabulations of Major Principal Questionnaire Results (9-Year-Old Level) by Size of Community and Region, Reported in Percentages

	Total	Size of Community				Region					
		Big Cities	Fringe Cities	Medium Cities	Smaller Places	1	2	3	4	5	6
STUDENTS ARE ASSIGNED:											
Within grade	86.8	84.0	82.8	93.3	86.7	100	94.1	79.2	88.2	76.9	100
Regardless of grade	11.4	12.0	17.2	3.3	13.3	0	5.9	16.7	11.8	23.1	0
Both	1.8	4.0	0	3.3	0	0	0	4.2	0	0	0
STUDENTS ARE ASSIGNED:											
According to achievement	26.8	8.0	24.1	28.6	43.3	14.3	17.6	47.8	23.5	53.8	33.3
Regardless of achievement	68.8	84.0	72.4	64.3	56.7	85.7	76.5	43.5	76.5	46.2	66.7
Both	4.5	8.0	3.4	7.1	0	0	5.9	8.7	0	0	0
TYPICAL MATH CLASS IS:											
Traditional	59.6	66.7	46.7	70.0	56.7	86.7	58.8	48.0	58.8	46.2	33.3
Individualized	31.6	33.3	43.3	20.0	30.0	0	35.3	36.0	29.4	46.2	66.7
Both	8.8	0	10.0	10.0	13.3	13.3	5.9	16.0	11.8	7.7	0
CONSULTANT/SPECIALIST WORKING WITH MATH TEACHERS?											
Yes	33.9	68.0	30.0	20.0	23.3	0	41.2	36.0	11.8	23.1	33.3
No	66.1	32.0	70.0	80.0	76.7	100	58.8	64.0	88.2	76.9	66.7
MATH CURRICULUM OR PROGRAM DEVELOPMENT IN PAST 5 YEARS?											
Yes	67.5	66.7	63.3	63.3	76.7	26.7	94.1	76.0	64.7	76.9	33.3
No	32.5	33.3	36.7	36.7	23.3	73.3	5.9	24.0	35.3	23.1	66.7
PROBLEMS ACCORDING TO TEACHERS:											
Lack of funds for math supplies	26.1	76.0	6.7	20.0	10.0	13.3	5.9	16.0	17.6	7.7	0
Lack of audiovisual materials	22.5	48.0	16.7	26.7	6.7	13.3	17.6	16.0	35.3	0	0
Lack of planning time for teachers	39.1	56.0	26.7	43.3	33.3	33.3	52.9	36.0	35.3	7.7	33.3
Class sizes too large	29.2	45.8	23.3	41.4	10.0	26.7	37.5	20.0	17.6	30.8	0

TABLE 7.2

Crosstabulations of Major Principal Questionnaire Results (13-Year-Old Level) by Size of Community and Region, Reported in Percentages

	Total	Size of Community				Region					
		Big Cities	Fringe Cities	Medium Cities	Smaller Places	1	2	3	4	5	6
STUDENTS ARE ASSIGNED:											
Within grade	92.5	81.8	92.9	96.3	96.7	100	92.3	95.8	95.5	100	66.7
Regardless of grade	7.5	18.2	7.1	3.7	3.3	0	7.7	4.2	4.5	0	33.3
Both	0	0	0	0	0	0	0	0	0	0	0
STUDENTS ARE ASSIGNED:											
According to achievement	70.4	65.2	75.0	71.4	69.0	55.6	76.9	75.0	69.6	76.9	66.7
Regardless of achievement	29.6	34.8	25.0	28.6	31.0	44.4	23.1	25.0	30.4	23.1	33.3
Both	0	0	0	0	0	0	0	0	0	0	0
TYPICAL MATH CLASS IS:											
Traditional	73.4	65.2	75.0	75.0	76.7	80.0	76.9	70.8	73.9	76.9	100
Individualized	19.3	30.4	17.9	14.3	16.7	0	23.1	25.0	17.4	7.7	0
Both	7.3	4.3	7.1	10.7	6.7	20.0	0	4.2	8.7	15.4	0
CONSULTANT/SPECIALIST WORKING WITH MATH TEACHERS?											
Yes	32.4	54.5	39.3	10.7	30.0	0	46.2	33.3	26.1	23.1	0
No	67.6	45.5	60.7	89.3	70.0	100	53.8	66.7	73.9	76.9	100
MATH CURRICULUM OR PROGRAM DEVELOPMENT IN PAST 5 YEARS?											
Yes	73.4	69.6	67.9	78.6	76.7	60.0	76.9	87.5	78.3	53.8	66.7
No	26.6	30.4	32.1	21.4	23.3	40.0	23.1	12.5	21.7	46.2	33.3
PROBLEMS ACCORDING TO TEACHERS:											
Lack of funds for math supplies	30.8	63.6	18.5	21.4	26.7	30.0	16.7	20.8	21.7	23.1	33.3
Lack of audiovisual materials	19.4	27.3	14.3	14.3	23.3	10.0	15.4	16.7	21.7	15.4	33.3
Lack of Planning time for teachers	23.1	22.7	21.4	21.4	26.7	30.0	7.7	37.5	13.0	23.1	33.3
Class Sizes too large	31.1	18.2	39.3	46.2	20.0	44.4	23.1	41.7	36.4	30.8	0

TABLE 7.3

Crosstabulations of Major Principal Questionnaire Results (17-Year-Old Level) by Size of Community and Region, Reported in Percentages

	Total	Size of Community				Region					
		Big Cities	Fringe Cities	Medium Cities	Smaller Places	1	2	3	4	5	6
STUDENTS ARE ASSIGNED:											
Within grade	13.5	7.1	12.5	9.5	20.0	27.3	0	15.8	17.6	20.0	0
Regardless of grade	79.8	92.9	83.3	81.0	70.0	63.6	100	78.9	70.6	60.0	100
Both	3.4	0	4.2	4.8	3.3	9.1	0	5.3	5.9	0	0
STUDENTS ARE ASSIGNED:											
According to achievement	62.9	57.1	70.8	61.9	60.0	54.5	53.3	73.7	82.4	50.0	33.3
Regardless of achievement	29.2	35.7	20.8	28.6	33.3	45.5	40.0	10.5	11.8	40.0	66.7
Both	5.6	7.1	8.3	4.8	3.3	0	6.7	15.8	0	0	0
STUDENTS ARE ASSIGNED:											
According to program	32.6	14.3	29.2	42.9	36.7	36.4	20.0	36.8	41.2	40.0	66.7
Regardless of program	61.8	78.6	66.7	52.4	56.7	54.5	73.3	57.9	58.8	50.0	33.3
Both	2.2	0	4.2	4.8	0	0	6.7	5.3	0	0	0
CONSULTANT/SPECIALIST WORKING WITH MATH TEACHERS?											
Yes	22.5	14.3	41.7	23.8	10.0	0	40.0	26.3	35.3	10.0	0
No	77.5	85.7	58.3	76.2	90.0	100	60.0	73.7	64.7	90.0	100
MATH CURRICULUM OR PROGRAM DEVELOPMENT IN PAST 5 YEARS?											
Yes	76.4	85.7	66.7	85.7	73.3	54.5	80.0	73.7	82.4	80.0	66.7
No	23.6	14.3	33.3	14.3	26.7	45.5	20.0	26.3	17.6	20.0	33.3
PROBLEMS ACCORDING TO TEACHERS:											
Lack of funds for math supplies	27.0	42.9	20.8	23.8	26.7	18.2	20.0	26.3	35.3	10.0	33.3
Lack of audiovisual materials	20.2	35.7	20.8	14.3	16.7	0	0	26.3	29.4	20.0	33.3
Lack of planning time for teachers	14.6	21.4	8.3	19.0	13.3	9.1	6.7	15.8	5.9	30.0	33.3
Class sizes too large	28.1	35.7	20.8	42.9	20.0	0	20.0	42.1	29.4	20.0	66.7

schools in the sample at each grade level and for schools in each region and in each size of community. Table 7.4 displays the data by size of community, while Table 7.5 displays the data by region.

The chapter is organized by questionnaire item with supporting narrative describing the highlights of the results for all principals for each age level (overview) and the major differences in responses for principals in different regions and sizes of community. The reader should note that the grouping of principals by *region does not include* principals of schools in "big cities" in those regions. The responses of principals of "big city" schools are reported separately under the size of community breakdown.

Grade Level Organization of Classrooms

Principals of students at all three age levels were asked to indicate whether classrooms in their schools were organized predominately by grade level or irrespective of grade level.

Overview. Principals of 9-year-olds and 13-year-olds generally indicated that classes are organized according to grade level (86.8% and 92.5%, respectively), whereas principals of 17-year-olds overwhelmingly indicated that classes are organized irrespective of grade level (79.8%).

Differences by size of community. Although the overall pattern for a given student age level in communities of all different sizes was similar to the statewide pattern for that grade level, some differences in degree of similarity were observed:

- A somewhat higher percentage of big city schools for 13- and 17-year-olds organize classrooms irrespective of grade level than statewide (18.2% and 92.9% versus 7.5% and 79.8%, respectively).

- A somewhat lower percentage of smaller community schools for 17-year-olds organize classrooms irrespective of grade level than statewide (70% versus 79.8%).

Differences by region. Although the overall pattern for a given age level in each different region resembled the statewide pattern for that age level, there was considerable variability between regions in the degree of similarity:

- Region 1 had a somewhat higher percentage of principals of schools for each age level with classes organized by grade level than was found statewide.

- Region 2 had a considerable higher percentage of principals of schools for 17-year-olds with non-grade-level organization of classrooms (100% versus 79.8% statewide).

- Region 3 had a somewhat higher percentage of principals for each age level with students assigned to classes according to achievement level than was found statewide.

- Region 4 had a slightly lower percentage of principals of schools for 17-year-olds with non-grade-level organization than was found statewide (70.6% versus 79.8% statewide).

- Region 5 had a somewhat lower percentage of principals of schools for 17-year-olds with non-grade-level organization of classes (60% versus 79.8% statewide).

- Region 6 had a somewhat lower percentage of principals of schools for 9-year-olds with non-grade-level organization (0% versus 11.4% statewide) but a considerably *higher* percentage of principals of schools with such organization for 13- and 17-year-olds (33.3% and 100% versus 7.5% and 79.8% statewide, respectively).

Achievement Level Organization of Classrooms

Principals of schools for students of each grade level were asked whether classrooms in their schools were generally organized according to achievement level or irrespective of achievement level.

Overview. About two-thirds of the principals of schools for 9-year-olds indicated that classroom organization was not based on achievement level, whereas slightly over two-thirds of the principals of schools for 13-year-olds and slightly under two-thirds of the principals of schools for 17-year-olds indicated that classes were generally organized on that basis.

Differences by size of community. The overall pattern for a given age level in communities of each size paralleled the statewide pattern fairly closely, with the following variations in degree of similarity:

- A somewhat higher percentage of big city principals of schools for 9-year-olds and a somewhat lower percentage of smaller community principals at that age level have classrooms generally organized irrespective of achievement level (84% and 56.7%, respectively, versus 68.8% statewide).

- A slightly higher percentage of fringe city principals of schools for 17-year-olds reported that classroom organization is generally achievement-based (70.8% versus 62.9% statewide).

Differences by region. The overall pattern within each region for a given age level usually resembled the statewide pattern, with the following variations and exceptions:

- In general, a somewhat lower percentage of Region 1 principals of schools for each age level reported achievement-based organization of classrooms compared to statewide results.

- In Region 2, a slightly higher percentage of principals of schools for 13- and 17-year-olds and a slightly lower percentage of principals of schools for 9-year-olds reported achievement-based organization compared to statewide results.

- In Region 3, a slightly higher percentage of principals of schools for 13- and 17-year-olds and a *considerably lower* percentage of principals of schools for 9-year-olds reported achievement-based organization compared to statewide results.

- In Region 4, a considerably higher percentage of principals of schools for 17-year-olds reported achievement-based organization compared to principals statewide.

- In Region 5, the percentage of principals reporting achievement-based organization was considerably higher for schools for 9-year-olds and slightly higher for schools for 13-year-olds, though somewhat *lower* for schools for 17-year-olds compared to principals statewide.

- In Region 6, a considerably lower percentage of principals of schools for 17-year-olds reported achievement-based organization, compared to statewide results.

Program Organization of Classrooms

Principals of schools for 17-year-olds were asked whether classes were generally organized according to curricular programs or irrespective of programs.

Overview. Statewide, the results reveal that a majority (61.8%) of the principals' schools do not generally organize classrooms on the basis of programs.

Differences by size of community. The results by size of community paralleled the statewide results, with considerable differences in degree in the big cities, where a somewhat higher percentage of principals reported that their schools do not generally have program-based organization (78.6%), and in the medium cities, where a somewhat lower percentage so reported (52.2%).

Differences by region. In every region except Region 6, where the pattern was reversed, a majority reported non-program-based classes are the general rule. A somewhat higher percentage in Region 2 (73.3%) reported that non-program-based classes predominated in their schools in comparison to the statewide results.

Math Class Instructional Format

Principals of schools for 9- and 13-year-olds were asked whether the typical mathematics class in their school utilized traditional teacher-centered activities or individualized instruction techniques.

Overview. Approximately 73% of principals of schools for 13-year-olds and 60% of principals of schools for 9-year-olds indicated that traditional techniques predominate in their schools.

Differences by size of community. In consonance with the statewide pattern, the largest group of principals of schools for each age level in communities of each size indicated that traditional methods prevail. However, in comparison to the statewide results, a somewhat higher percentage of fringe city principals of schools for 9-year-olds and big city principals of schools for 13-year-olds reported that individualized instruction prevails at their schools.

Differences by region. In every region except Region 6, where the pattern was reversed, a majority of principals of schools for 9-year-olds reported that traditional methods prevail. In every region except Region 6, 20-30% of the principals of 13-year-olds reported that individualized instruction prevails. In Region 6, all of the principals of schools for 13-year-olds reported that traditional methods predominate.

Consultants or Specialists in Mathematics

Principals of schools for each age level were asked whether there were consultants or specialists who worked with mathematics teachers in their schools.

Overview. Only 22.5% of principals of schools for 17-year-olds reported the availability of consultants or specialists, but a slightly higher percentage of principals of schools for 13- and 9-year-olds responded positively (about one-third of each group).

Differences by size of community. The pattern across communities of different sizes for principals of schools for 17-year-olds invariably resembled the statewide distribution, although compared to statewide results a considerably higher percentage of fringe city principals reported the availability of consultants or specialists and somewhat lower percentages of big city and smaller community principals responded positively.

At the 9- and 13-year-old level, the pattern across communities of different sizes resembled the statewide pattern everywhere except in the big cities, where the pattern was reversed (i.e., a majority reported that consultants or specialists are available). A somewhat smaller percentage of medium-sized city principals at each of these age levels responded positively compared to the statewide results (10.7% versus 32.4% at the 13-year-old level and 20% versus 33.9% at the 9-year-old level).

Differences by region. The basic pattern of responses resembled the statewide pattern in every region for principals of schools for each age level of student, i.e., a majority of the principals in each group reported that consultants or specialists are not available. However, there was considerable variability in the degree of similarity to the statewide pattern:

- Region 2 had the lowest percentage of principals of schools for each grade level who stated that consultants or specialists are not available.

- Regions 1 and 6 generally showed the highest percentages of principals of schools for each age level who responded negatively, with *all* of the Region 1 principals reporting that consultants or specialists are not available and all of the Region 6 principals for 17- and 13-year-olds and two-thirds of the principals for 9-year-olds responding negatively.

Mathematics Curriculum Development

Principals of schools for each age level were asked whether there had been any major curriculum or program development in mathematics in their schools during the last five years.

Overview. A clear majority of the principals for each age level responded positively, with approximately three-fourths of the principals of schools for 17- and 13-year-olds and about two-thirds of the principals for 9-year-olds reporting recent curriculum or program development.

Differences by size of community. The pattern at each age level across all different-sized communities resembled the statewide pattern, with only minor variations in the degree of similarity to statewide results.

Differences by region. In general, a majority of principals for each age level in each region reported recent mathematics curriculum or program development. The only exceptions to this pattern were in Regions 1 and 6, where only 26.7% and 33.3%, respectively, of the principals for 9-year-olds reported such development.

In Region 1, even at the 17- and 13-year-old level, where a majority did respond positively, the percentage so reporting was somewhat lower than statewide. In contrast, in comparison to statewide results, a somewhat higher percentage of principals in Region 2 responded positively.

Funds for Mathematics Supplies

Principals of schools for each age level were asked whether, according to their mathematics teachers, there was a lack of funds for mathematics supplies in their schools.

Overview. Well under half of the principals for each age level reported that their teachers feel there is a lack of funds (26.1% at the

9-year-old level, 30.8% at the 13-year-old level, and 27% at the 17-year-old level).

Differences by size of community. The only departure from the statewide results was found in the big cities, where 42.9% at the 17-year-old level, 63.6% at the 13-year-old level, and 76% at the 9-year-old level reported teacher sentiment about insufficient funds. In comparison to statewide results, the fringe cities generally showed a somewhat smaller percentage of principals reporting teacher sentiment about lack of funds.

Differences by region. The pattern by region at each age level resembled the statewide results. The following differences in degree of similarity were observed:

- Only 10% of Region 5 principals of 17-year-olds reported lack of funds according to their teachers.
- Only 16.7% of Region 2 principals of 13-year-olds reported lack of funds according to their teachers.
- None from Region 6, only 5.9% from Region 2, and 7.7% from Region 5 reported lack of funds at the 9-year-old level.

Audiovisual Materials

Principals of schools for each age level were asked whether, according to their mathematics teachers, there was a lack of audiovisual materials in their schools.

Overview. Relatively few principals at any age level responded positively to this question: 20.2% at the 17-year-old level, 19.4% at the 13-year-old level, and 23.5% at the 9-year-old level.

Differences by size of community. In comparison to statewide results, a higher percentage of big city principals of schools for each age level indicated that their teachers report an insufficiency of audiovisual materials. This trend was most pronounced at the 9-year-old level, where 48% of the big city principals reported a lack of such materials, in comparison to only 6.7% of smaller community principals of schools for 9-year-olds who gave this response.

Differences by region. In consonance with the statewide results, no region at any age level showed a high percentage of principals reporting insufficient audiovisual materials. However, there was some degree of variability between regions at different age levels:

- None of the Regions 5 and 6 principals of schools for 9-year-olds reported an insufficiency, whereas 35.3% of Region 4 principals at this age level did.
- Only 10% of Region 1 principals of schools for 13-year-olds reported an insufficiency of audiovisual materials, although one-third of Region 6 principals at this level did.
- None of the Regions 1 and 2 principals of schools for 17-year-olds responded positively, but one-third of the Region 6 principals at this level did.

Teacher Preparation Time

Principals of schools for each age level were asked whether their mathematics teachers felt there was a lack of planning time for teachers in their schools.

Overview. Statewide, the percentage of principals responding positively decreased uniformly from 39.1% at the 9-year-old level to 14.6% at the 17-year-old level.

Differences by size of community. At the 13-year-old level, there were no differences by community size.

At the 17-year-old level, compared to statewide results, a slightly higher percentage of big city principals (21.4%) and a slightly lower percentage of fringe city principals (8.3%) reported lack of planning time.

At the 9-year-old level, compared to statewide results, a considerably higher percentage of big city principals (56%) and a somewhat lower percentage of fringe city principals (26.7%) reported an insufficiency of planning time.

Differences by region. At the 17-year-old level, compared to statewide results, a somewhat higher percentage of Regions 5 and 6 principals reported lack of planning time (30% and 33.3%, respectively).

At the 13-year-old level, compared to statewide results, a somewhat higher percentage of Region 3 principals (37.5%) and a somewhat lower percentage of Region 2 principals (7.7%) reported lack of planning time for teachers.

At the 9-year-old level, compared to statewide results, a somewhat higher percentage of Region 2 principals (52.9%) and a somewhat lower percentage of Region 5 principals (7.7%) reported a lack of teacher planning time.

Class Size

Principals of schools for each age level were asked whether their mathematics teachers generally felt that class sizes were too large in their schools.

Overview. At each age level, approximately 30% of the principals responded positively to this question.

Differences by size of community. At the 17-year-old level, compared to statewide results, a somewhat higher percentage of big and medium city principals reported oversized classes (35.7% and 42.9%, respectively).

At the 13-year-old level, compared to statewide results, a somewhat higher percentage of fringe and medium city principals reported oversized classes (39.3% and 46.2%, respectively).

At the 9-year-old level, compared to statewide results, a somewhat higher percentage of big and medium city principals reported oversized classes (45.8% and 41.4%, respectively), whereas only 10% of smaller community principals reported such overcrowding of classrooms.

Differences by region. At the 17-year-old level, compared to statewide results, a much higher percentage of Region 6 principals (66.7%), a somewhat higher percentage of Region 3 principals (42.1%), and a considerably lower percentage of Region 1 principals (0%) reported oversized classes.

At the 13-year-old level, compared to statewide results, a somewhat higher percentage of Region 1 principals (44.4%) and Region 3 principals (41.7%) and a considerably lower percentage of Region 6 principals (0%) reported oversized classes.

At the 9-year-old level, compared to statewide results, a somewhat higher percentage of Region 2 principals (37.5%) and a considerably lower percentage of Region 6 principals (0%) reported overcrowded classrooms.

Total School Enrollment

Principals of schools for each age-level student were asked to report figures on the total school enrollment in their schools (see Tables 7.4 and 7.5).

Overview. The average school enrollment at the 9-year-old level was approximately 396; at the 13-year-old level it was approximately 722; and at the 17-year-old level it was approximately 1,341.

Differences by size of community. At the 17-year-old level, the average school enrollment in smaller communities was about 30% lower than the statewide average, whereas the average school enrollments in communities of other sizes were only slightly higher than the statewide average.

At the 13-year-old level, the average school enrollment in smaller communities was about 15% lower than the statewide average, whereas the

TABLE 7.4

Means for Selected Principal Questionnaire Variables by Size of Community

Variable	Total	Size of Community			
		Big Cities	Fringe Cities	Medium Cities	Smaller Places
9-YEAR-OLDS					
Total School Enrollment	396.2	401.8	380.1	398.6	405.3
Fourth-Grade Enrollment	64.5	59.0	63.3	57.4	77.4
Math Class Size	22.2	21.0	22.2	22.9	22.3
Number of Instructional Aides	1.2	1.4	0.6	1.1	1.7
Hours of Math per Class per Week	4.1	4.2	4.0	4.4	4.0
13-YEAR-OLDS					
Total School Enrollment	721.9	753.6	761.6	760.5	624.5
Eighth-Grade Enrollment	236.9	236.9	218.7	292.6	248.0
Math Class Size	24.1	25.6	24.2	24.6	22.5
Number of Instructional Aides	0.3	0.8	0.1	0.0	0.4
Hours of Math per Class per Week	3.7	3.7	3.6	3.8	3.9
17-YEAR-OLDS					
Total School Enrollment	1340.9	1475.1	1577.9	1552.6	933.4
Eleventh-Grade Enrollment	346.5	330.4	447.2	430.7	211.7
Math Class Size	22.1	21.7	22.3	23.0	21.6
Number of Instructional Aides	0.1	0.2	0.1	0.1	0.0
Hours of Math per Class per Week	3.4	3.4	3.3	3.5	3.3

TABLE 7.5

Means for Selected Principal Questionnaire Variables by Region of State

Variable	Total	Region of State					
		1	2	3	4	5	6
9-YEAR-OLDS							
Total School Enrollment	396.2	396.1	397.9	408.0	334.6	435.8	419.3
Fourth-Grade Enrollment	64.5	71.6	65.7	65.9	54.9	72.9	73.7
Math Class Size	22.2	22.1	22.9	22.6	21.9	22.8	22.7
Number of Instructional Aides	1.2	0.1	0.2	1.5	0.3	1.8	10.7
Hours of Math per Class per Week	4.1	3.4	3.7	4.5	4.4	4.5	4.3
13-YEAR-OLDS							
Total School Enrollment	721.9	804.5	799.8	780.2	687.5	519.5	540.3
Eighth-Grade Enrollment	236.9	276.6	326.1	258.6	213.5	175.5	129.3
Math Class Size	24.1	24.1	23.7	23.9	24.8	22.0	20.7
Number of Instructional Aides	0.3	0.5	0.1	0.1	0.3	0.3	0.0
Hours of Math per Class per Week	3.7	3.2	3.6	3.4	4.0	3.8	6.3
17-YEAR-OLDS							
Total School Enrollment	1340.9	1130.0	1733.7	1374.9	1375.3	869.9	840.3
Eleventh-Grade Enrollment	346.5	258.9	485.1	388.5	354.2	220.3	203.0
Math Class Size	22.1	21.6	23.0	22.1	22.9	20.8	21.7
Number of Instructional Aides	0.1	0	0.2	0.1	0	0.1	0
Hours of Math per Class per Week	3.4	3.0	3.2	3.1	3.7	3.4	4.7

average school enrollments in communities of other sizes were only slightly higher than the statewide average.

At the 9-year-old level, there were no sizeable differences across regions in average school enrollment in comparison to the statewide average.

Differences by region. At the 17-year-old level, the average school enrollment in Region 2 was about 30% higher than the statewide average, whereas in Regions 5 and 6 the average school enrollment was about 35% lower than the statewide average.

At the 13-year-old level, the average school enrollment was 28% lower than the statewide average in Region 5, 25% lower in Region 6, and about 5% lower in Region 4, and was slightly higher than the statewide average in the other three regions.

At the 9-year-old level, there were no sizeable differences from the statewide average school enrollment in any region.

In-Grade Enrollment

Principals for each age level student were asked to indicate what the "in-grade" enrollment was for the age-level student being tested in his or her school (i.e., fourth, eighth, or eleventh grade enrollment, respectively, for 9-, 13-, and 17-year-olds).

Overview. Statewide, the average fourth-grade enrollment per school was approximately 65; the average eighth-grade enrollment per school was approximately 237; and the average eleventh-grade enrollment per school was approximately 347.

Differences by size of community. At the 17-year-old level, the big city eleventh-grade mean enrollment was about the same as the statewide average. The fringe city and medium city mean enrollment was about 30% higher than the statewide average, and the smaller community eleventh-grade mean enrollment was about 40% lower than the statewide average.

At the 13-year-old level, the big and medium city eighth-grade mean enrollment was about the same as the statewide average. In contrast, the average eighth-grade enrollment in schools in smaller places was about 21% lower than the statewide average, and the average in fringe cities was about 23% higher than the statewide average.

At the 9-year-old level, the big city, fringe city, and medium city fourth-grade mean enrollment was about the same as the statewide average, whereas the smaller community fourth-grade mean enrollment was approximately 18% higher than the statewide average.

Differences by region. At the 17-year-old level, Region 3 and 4 eleventh-grade mean enrollment was about the same as the statewide average, whereas the Region 2 eleventh-grade mean enrollment was about 40% higher than the statewide average. In contrast, the Region 1 eleventh-grade average was about 25% above the statewide average, and the Regions 5 and 6 averages were about 40% above the statewide average.

At the 13-year-old level, the average eighth-grade enrollment in Regions 3 and 4 was about the same as the statewide average. In contrast, the average was about 38% higher than the statewide average in Region 2 and about 16% higher than the statewide average in Region 1, the average in

Region 6 was about 46% lower than the statewide average, and the average in Region 5 was about 26% lower than the statewide average.

At the 9-year-old level, there were no sizeable differences from the statewide average fourth-grade enrollment in any region.

Average Math Class Size

Principals of students of each age level were asked to indicate what the average mathematics class size was in their schools.

Overview. The statewide average mathematics class size for 9-year-olds was approximately 22; for 13-year-olds it was approximately 24; and for 17-year-olds it was approximately 22.

Differences by size of community. At the 17-year-old level, there were no sizeable differences from the statewide average across communities of different sizes.

At the 13-year-old level, there were no large differences from the statewide average math class size across communities of different sizes.

At the 9-year-old level, there were no sizeable differences from the statewide average across communities of different sizes.

Differences by region. At the 17-year-old level, there were no sizeable differences from the statewide average mathematics class size across different regions.

At the 13-year-old level, the average math class size was about the same as the statewide average in every region except Region 6, where the average was about 14% lower than the statewide average.

At the 9-year-old level, there were no sizeable differences from the statewide average across different regions.

Number of Instructional Aides

Principals of students of each age level were asked to indicate how many instructional aides in mathematics were available in their schools.

Overview. At the 9-year-old level, statewide, there was about one aide per school, whereas at the 13- and 17-year-old levels, statewide, there was less than one aide per school.

Differences by size of community. At the 17-year-old level, there was less than one aide per school across communities of different sizes.

At the 13-year-old level, on the average, there was less than one aide per school across communities of different sizes.

At the 9-year-old level, there was less than one aide per school in the fringe cities, about one aide per school in the big and medium cities, and close to two aides per school in the smaller communities.

Differences by region. At the 17-year-old level, there was less than one aide per school in every region.

At the 13-year-old level, on the average, there was less than one aide per school in every region.

At the 9-year-old level, there was less than one aide per school in Regions 1, 2, and 4, whereas the average number of aides per school was 1.5 in Region 3, 1.8 in Region 5, and 10.7 in Region 6.

Hours of Math per Class per Week

Principals of students of each age level were asked to indicate how many hours of mathematics instruction were given per class per week.

Overview. At the 9-year-old level, statewide, the average number of hours of mathematics per class per week was 4.1; at the 13-year-old level, the statewide average was 3.7 hours; at the 17-year-old level, the statewide average was 3.4 hours.

Differences by size of community. At the 17-year-old level, no sizeable differences from the statewide average were found across communities of different sizes.

At the 13-year-old level, there were no sizeable differences from the statewide average number of hours of math per calss per week across communities of different sizes.

At the 9-year-old level, no sizeable differences from the statewide average were found across communities of different sizes.

Differences by region. At the 17-year-old level, average hours of math per class per week were about the same as the state in every region except Region 6, where the average was about 38% higher than the statewide average.

At the 13-year-old level, there were no sizeable differences from the statewide average in any region except Region 6, where the average number of hours of math per class per week was approximately 70% higher than the statewide average.

At the 9-year-old level, average hours of math per class per week were about the same as the statewide average in every region except Region 1, where the average was about 17% lower than the statewide average.

APPENDIX A

Copies of Test Items for 9-, 13-, and 17-Year-Olds, with Corresponding Percentages of All Students Selecting Each Response

KEY FOR APPENDIX A

GOAL AREA
Objective (in abbreviated form; see Tables 1.1, 1.2, and 1.3 for complete objective lists)

		9	13	17	◄ Age level
Question as it appeared in test (reduced size)		#__	#__	#__	◄ Item position on test
Numbers corresponding to choices	1	__%	__%	__%	Percentage of students selecting each response
	2	__%	__%	__%	
	3	__%	__%	__%	
	4	__%	__%	__%	

* NAEP item

** Modified NAEP item

☐ Indicates that the item appears exactly the same on another page in Appendix A, as it was also tested in a different objective for a different age level.

— The correct answer is darkened for multiple-choice questions and entered on the line for open-ended questions.

— Numerical descriptions of response choices are keyed to multiple-choice responses or, in the case of open-ended items, to the NAEP scoring categories listed below the item.

MATHEMATICAL CONCEPTS

1. Place Value *(9)*

		9	13	17
• What digit is in the ten's place in 4263?		#8		
1 ○ 2	1	10%		
2 ○ 3	2	4%		
3 ○ 4	3	6%		
4 ● 6	4	79%		
•• Which one of the following is the sum of three hundreds, eight tens, and four ones?		#25		
1 ○ 15	1	2%		
2 ● 384	2	78%		
3 ○ 300,804	3	13%		
4 ○ 3840	4	5%		
• 762 =		#14		
1 ○ 7 + 6 + 2	1	12%		
2 ○ 7 + 60 + 200	2	4%		
3 ● 700 + 60 + 2	3	81%		
4 ○ 70 + 60 + 20	4	2%		
In which number does 7 stand for 7 thousand?		#43		
1 ○ 2735	1	11%		
2 ○ 8079	2	3%		
3 ● 17,204	3	78%		
4 ○ 24,716	4	4%		

MATHEMATICAL CONCEPTS

1. Place Value *(9)*

		9	13	17
In 3654 the 4 means:		#55		
1 ○ 40	1	2%		
2 ○ 400	2	4%		
3 ● 4	3	80%		
4 ○ 4000	4	10%		

MATHEMATICAL CONCEPTS

1. Rational Numbers *(13, 17)*

$\frac{1}{5}$ is equivalent to what percent?

ANSWER: 20 %

NAEP SCORING CRITERIA

(1) 20
(2) .20
(3) 5; .05

	9	13	17
		#25	*#7*
1		55%	63%
2		1%	4%
3		15%	14%

.009 is equivalent to what fraction?

1○ $\frac{900}{1000}$

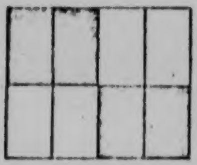
2● $\frac{9}{1000}$

3○ $\frac{9}{100}$

4○ $\frac{90}{100}$

	9	13	17
		#6	*#35*
1		10%	7%
2		70%	74%
3		19%	18%
4		1%	1%

Which set of fractions describes the shaded portion of the figure below?



1○ $\frac{1}{4}$, $\frac{2}{8}$, $\frac{4}{16}$

2○ $\frac{4}{8}$, $\frac{2}{6}$, $\frac{1}{3}$

3● $\frac{4}{8}$, $\frac{2}{4}$, $\frac{1}{2}$

4○ $\frac{1}{2}$, $\frac{2}{3}$, $\frac{3}{8}$

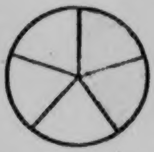
	9	13	17
			#9
1			6%
2			3%
3			86%
4			3%

MATHEMATICAL CONCEPTS

1. Rational Numbers *(13, 17)*

•• ☐ .

What fractional part of the figure below is shaded?



1 ○ $\frac{2}{3}$

2 ○ $\frac{1}{3}$

3 ● $\frac{2}{5}$

4 ○ $\frac{1}{4}$

	9	13	17
	#41	*#18*	
1	23%	6%	
2	3%	1%	
3	71%	93%	
4	1%	0	

••

There are 13 boys and 15 girls in a group. What fractional part of the group is boys?

1 ○ $\frac{3}{5}$

2 ○ $\frac{13}{15}$

3 ○ $\frac{15}{28}$

4 ● $\frac{13}{28}$

	9	13	17
		#5	*#62*
1		9%	10%
2		53%	31%
3		5%	6%
4		32%	52%

MATHEMATICAL CONCEPTS

2. Ordering *(9)*

		9	13	17
Which number is GREATEST?		*#10*		
1 ○ 66,449	1	6%		
2 ● 66,646	2	65%		
3 ○ 64,647	3	1%		
4 ○ 64,999	4	28%		
Which number is 10 more than 4375?		*#58*		
1 ○ 5375	1	19%		
2 ○ 4475	2	10%		
3 ○ 4380	3	10%		
4 ● 4385	4	59%		
Which number comes next? 98 99 100 ______		*#42*		
1 ○ 200	1	2%		
2 ○ 201	2	1%		
3 ○ 110	3	2%		
4 ● 101	4	95%		

MATHEMATICAL CONCEPTS
2. Ordering *(9, 13, 17)*

		9	13	17
Which number is GREATEST?			#19	#49
1 ○ 0.5	1		3%	2%
2 ● 5.0	2		86%	93%
3 ○ 0.005	3		11%	4%
4 ○ 0.05	4		0	1%
Which fraction is GREATEST?			#14	#59
1 ○ $\frac{2}{3}$	1		38%	31%
2 ○ $\frac{3}{4}$	2		12%	13%
3 ● $\frac{4}{5}$	3		30%	45%
4 ○ $\frac{5}{8}$	4		20%	9%
Which number is LEAST?		#15	#7	
1 ● 2979	1	83%	98%	
2 ○ 2997	2	3%	1%	
3 ○ 7297	3	2%	0	
4 ○ 7196	4	11%	1%	

MATHEMATICAL CONCEPTS

2. Ordering *(9, 13, 17)*

Which fraction should be in the space so that the fractions are ordered from smallest to greatest?

$\frac{1}{4}$, ______, $\frac{3}{8}$

1 ● $\frac{5}{16}$

2 ○ $\frac{1}{8}$

3 ○ $\frac{1}{2}$

4 ○ $\frac{2}{3}$

	9	13	17
		#66	#22
1		32%	57%
2		23%	12%
3		18%	15%
4		26%	16%

•

Which number is the SMALLEST?

1 ● 0.022
2 ○ 0.202
3 ○ 0.22
4 ○ 2.002

	9	13	17
			#53
1			77%
2			6%
3			10%
4			7%

••

Which number is GREATEST?

1 ○ 3000
2 ● 3200
3 ○ 2100
4 ○ 1200

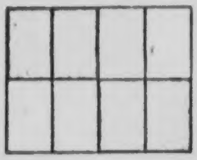
	9	13	17
	#4		
1	10%		
2	87%		
3	1%		
4	1%		

MATHEMATICAL CONCEPTS

3. Fractions *(9)*

••

What fractional part of the figure below is shaded?



1 ○ $\frac{8}{4}$

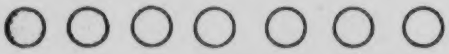
2 ● $\frac{4}{8}$

3 ○ $\frac{4}{4}$

4 ○ $\frac{2}{6}$

	9	13	17
	#52		
1	14%		
2	63%		
3	19%		
4	2%		

What fraction of all the dots are colored in?



1 ○ $\frac{7}{5}$

2 ○ $\frac{5}{7}$

3 ○ $\frac{2}{5}$

4 ● $\frac{2}{7}$

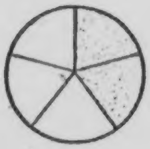
	9	13	17
	#36		
1	2%		
2	2%		
3	20%		
4	73%		

MATHEMATICAL CONCEPTS

3. Fractions *(9)*

• ☐

What fractional part of the figure below is shaded?



1 ○ $\frac{2}{3}$

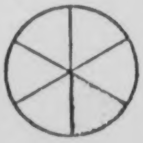
2 ○ $\frac{1}{3}$

3 ● $\frac{2}{5}$

4 ○ $\frac{1}{4}$

	9	13	17
	#41	*#18*	
1	23%	6%	
2	3%	1%	
3	72%	93%	
4	1%	0	

What fractional part of the figure below is shaded?



1 ○ $\frac{1}{3}$

2 ○ $\frac{1}{4}$

3 ○ $\frac{1}{5}$

4 ● $\frac{1}{6}$

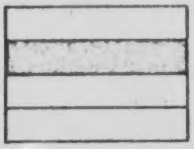
	9	13	17
	#27		
1	12%		
2	7%		
3	17%		
4	63%		

MATHEMATICAL CONCEPTS

3. Fractions *(9)*

••

What fractional part of the figure below is shaded?



1 ○ $\frac{1}{2}$

2 ● $\frac{1}{4}$

3 ○ $\frac{1}{3}$

4 ○ $\frac{4}{1}$

	9	13	17
	#2		
1	19%		
2	61%		
3	13%		
4	6%		

COMPUTATION

3. Whole Numbers (+ -) *(13, 17)*
4. Whole Numbers (+) *(9)*
5. Whole Numbers (-) *(9)*

		9	13	17
•				
Add: 38 + 19		*#20*	*#3*	*#6*
	1	89%	96%	97%
ANSWER: 57	2	1%	0	0
	3	3%	2%	1%
	4	0	0	0
NAEP SCORING CRITERIA	5	6%	2%	2%
(1) 57 (2) 417 (3) 47 (4) 19; 29 (5) other unacceptable response				
•				
Subtract: 36 − 19		*#21*	*#9*	*#14*
	1	77%	93%	95%
ANSWER: 17	2	2%	1%	1%
	3	1%	0	0
NAEP SCORING CRITERIA	4	0	0	0
	5	11%	5%	4%
	6	7%	0	0
(1) 17 (2) 27 (3) 55 (4) 45 (5) other unacceptable response (6) 23				
Do the following addition: 826 + 786		*#32*	*#8*	*#28*
1 ○ 1502	1	2%	0	0
2 ● 1612	2	87%	97%	95%
3 ○ 1602	3	3%	1%	2%
4 ○ 1512	4	7%	2%	3%

COMPUTATION

3. Whole Numbers (+ -) *(13, 17)*
4. Whole Numbers (+) *(9)*
5. Whole Numbers (-) *(9)*

•

Do the following subtraction:

```
 1054
- 865
```

ANSWER: 189

NAEP SCORING CRITERIA

(1) 189
(2) 299
(3) 199; 289
(4) any attempt to add; e.g. 1919
(5) other unacceptable response
(6) +-211; +-1811; +-11; +-811
(7) 1189; 1299; 1199; 1289

	9	13	17
	#13	*#12*	*#26*
1	51%	87%	92%
2	2%	0	0
3	9%	4%	2%
4	1%	0	0
5	26%	8%	4%
6	6%	0	0
7	4%	1%	1%

• □

Add:

```
  $ 3.06
   10.00
    9.14
 +  5.10
```

ANSWER: $ 27.30

NAEP SCORING CRITERIA

(1) $27.30; 27.30
(2) 2730; $2730 (any decimal error)
(3) 27.20; $27.20; 17.30; $17.30 can misplace decimal
(4) 17.20; $17.20 can misplace decimal
(5) 117210; 11721 can misplace decimal
(6) other unacceptable response

	9	13	17
	#22	*#24*	*#15*
1	48%	88%	94%
2	27%	5%	1%
3	5%	2%	1%
4	0	0	0
5	0	0	0
6	18%	4%	3%

Add:

```
   634
    41
+ 5122
```

1 ○ 5177
2 ○ 1197
3 ○ 6797
4 ● 5797

	9
	#53
1	2%
2	2%
3	3%
4	91%

COMPUTATION
4. Whole Numbers (+) *(9)*
5. Whole Numbers (-) *(9)*

Add: 725
+ 203

1 ○ 908
2 ○ 728
3 ● 928
4 ○ 807

	9	13	17
	#59		
1	3%		
2	3%		
3	93%		
4	0		

Subtract: 861
− 583

1 ○ 378
2 ● 278
3 ○ 388
4 ○ 322

	9	13	17
	#56		
1	5%		
2	75%		
3	6%		
4	10%		

Subtract: 659
− 207

1 ○ 402
2 ● 452
3 ○ 552
4 ○ 453

	9	13	17
	#29		
1	7%		
2	88%		
3	2%		
4	2%		

Subtract: 476
− 38

1 ○ 338
2 ○ 448
3 ○ 442
4 ● 438

	9	13	17
	#45		
1	7%		
2	6%		
3	9%		
4	76%		

COMPUTATION

4. Whole Numbers (x) *(13, 17)*

		9	13	17
Multiply: 38 x 9 ANSWER: 342 NAEP SCORING CRITERIA (1) 342 (2) 272 (3) 2772 (4) 297 (5) other unacceptable response			*#1*	*#4*
	1		87%	88%
	2		0	0
	3		0	0
	4		0	0
	5		12%	11%
Multiply: 46 x 50 1 ○ 23,000 2 ○ 230 3 ○ 2000 4 ● 2300			*#16*	*#55*
	1		2%	1%
	2		2%	2%
	3		1%	1%
	4		95%	95%
Multiply: 74 x 38 1 ○ 2782 2 ○ 2912 3 ○ 2712 4 ● 2812			*#20*	*#52*
	1		3%	4%
	2		2%	2%
	3		5%	4%
	4		89%	89%
Multiply: 609 x 73 1 ○ 6090 2 ○ 44,497 3 ○ 48,097 4 ● 44,457			*#32*	*#20*
	1		1%	1%
	2		3%	2%
	3		3%	1%
	4		91%	95%

COMPUTATION

6. Whole Numbers (x) *(9)*

		9	13	17
Multiply: 63 x 3		*#40*		
1 ● 189	1	89%		
2 ○ 99	2	4%		
3 ○ 186	3	2%		
4 ○ 96	4	4%		
Multiply: 312 x 4		*#34*		
1 ○ 1258	1	3%		
2 ○ 756	2	5%		
3 ● 1248	3	89%		
4 ○ 1346	4	1%		
Multiply: 36 x 3		*#31*		
1 ○ 98	1	7%		
2 ○ 918	2	5%		
3 ● 108	3	81%		
4 ○ 69	4	5%		
Multiply: 402 x 7		*#11*		
1 ○ 2804	1	12%		
2 ○ 2874	2	14%		
3 ○ 2914	3	5%		
4 ● 2814	4	68%		
Multiply: 4613 x 5		*#3*		
1 ● 23,065	1	78%		
2 ○ 23,105	2	7%		
3 ○ 20,055	3	8%		
4 ○ 23,055	4	5%		

COMPUTATION

5. Whole Numbers (÷) *(13, 17)*

		9	13	17
Divide: 5)125			*#27*	*#17*
ANSWER: 25	1		94%	95%
	2		1%	1%
NAEP SCORING CRITERIA	3		5%	4%
(1) 25 (2) 21 (3) other unacceptable response				
Divide: 22)339			*#60*	*#10*
1 ● 15 R9	1		84%	91%
2 ○ 10 R9	2		5%	3%
3 ○ 10 R19	3		5%	3%
4 ○ 11 R17	4		4%	2%
Divide: 4)$8.96			*#21*	
1 ○ $2.28	1		6%	
2 ○ $2.21	2		2%	
3 ● $2.24	3		91%	
4 ○ $428.00	4		1%	
Divide: 17)$74.46				*#36*
1 ○ $43.80	1			7%
2 ○ $3.78	2			2%
3 ○ $14.38	3			2%
4 ● $4.38	4			88%
Divide: 7)714			*#15*	*#1*
1 ○ 12	1		22%	19%
2 ○ 101 R4	2		2%	1%
3 ● 102	3		74%	77%
4 ○ 120	4		2%	2%

COMPUTATION

6. Decimals (+ -) *(13, 17)*

		9	13	17
Subtract the following numbers: $10.00 − 1.98			*#61*	*#37*
1 ○ $8.12	1		5%	3%
2 ○ $9.98	2		2%	1%
3 ● $8.02	3		85%	90%
4 ○ $9.02	4		7%	5%
0.6 + 8 + .24 =			*#17*	*#3*
1 ● 8.84	1		83%	87%
2 ○ 11	2		2%	2%
3 ○ 110	3		2%	2%
4 ○ 1.10	4		10%	7%
If 23.8 is subtracted from 62.1 the result is:			*#50*	*#24*
ANSWER: 38.3	1		72%	84%
	2		7%	4%
	3		0	1%
	4		0	0
	5		1%	0
	6		11%	8%
	7		2%	1%
	8		4%	1%

NAEP SCORING CRITERIA

(1) 38.3; 38 3/10
(2) correct subtraction
but misplaced decimal
(3) -38.3
(4) 49.3; 493; 4.93
(5) 85.9; 859; 8.59
(6) other unacceptable response
(7) 483; 393;
(can misplace decimal)
(8) +-417; +-17; +-617
(can misplace decimal)

COMPUTATION

6. Decimals (+ -) *(13, 17)*

• ☐

Add the following numbers:

$ 3.06
10.00
9.14
+ 5.10

ANSWER: $ 27.30

NAEP SCORING CRITERIA

(1) $27.30; 27.30
(2) 2730; $2730 (any decimal error)
(3) 27.20; $27.20; 17.30; $17.30
can misplace decimal
(4) 17.20; $17.20 can misplace decimal
(5) 117210; 11721 can misplace decimal
(6) other unacceptable response

	9	13	17
	#22	*#24*	*#15*
1	48%	88%	94%
2	27%	5%	1%
3	5%	2%	1%
4	0	0	0
5	0	0	0
6	18%	4%	3%

COMPUTATION
7. Decimals (x) *(13)*
7. Decimals (x ÷) *(17)*

Multiply: $1.98
x 4

1 ○ $7.62
2 ● $7.92
3 ○ $4.92
4 ○ $782

	9	13	17
		#42	
1		3%	
2		92%	
3		4%	
4		1%	

Multiply: 425
x 0.33

1 ○ 01.4025
2 ● 140.25
3 ○ 1402.5
4 ○ 14.025

	9	13	17
		#36	*#45*
1		4%	4%
2		86%	88%
3		3%	1%
4		7%	6%

Multiply: $1.29
x 0.06

1 ○ $7.74
2 ● $.0774
3 ○ $0077.4
4 ○ $.774

	9	13	17
		#43	*#38*
1		32%	20%
2		57%	71%
3		7%	5%
4		4%	3%

Multiply: 4.2
x 0.3

1 ○ 12.6
2 ○ .126
3 ● 1.26
4 ○ .0126

	9	13	17
		#29	
1		27%	
2		1%	
3		70%	
4		1%	

COMPUTATION

7. Decimals (x :) *(17)*

		9	13	17
Divide: $0.4\overline{)1.96}$				*#47*
1 ○ 49	1			8%
2 ○ 490	2			1%
3 ● 4.9	3			71%
4 ○ 0.49	4			18%
Divide: $0.25\overline{)17}$				*#51*
1 ○ 0.68	1			24%
2 ○ 6.8	2			8%
3 ● 68	3			60%
4 ○ 0.068	4			4%

COMPUTATION

8. Fractions (+ -) *(13, 17)*

		9	13	17
•• Do the following addition: $\frac{1}{2} + \frac{1}{3} =$			#22	#61
1 ● $\frac{5}{6}$	1		60%	72%
2 ○ $\frac{1}{5}$	2		29%	17%
3 ○ $\frac{1}{6}$	3		7%	6%
4 ○ $\frac{3}{2}$	4		3%	3%
Do the following addition: $\begin{array}{r} 2\frac{3}{8} \\ +\ 3\frac{7}{8} \\ \hline \end{array}$			#63	#56
1 ○ $5\frac{8}{10}$	1		13%	9%
2 ○ $5\frac{2}{8}$	2		11%	7%
3 ○ $6\frac{1}{8}$	3		11%	7%
4 ● $6\frac{1}{4}$	4		64%	76%
$\frac{5}{6} - \frac{1}{3} =$			#59	#46
1 ○ $\frac{4}{3}$	1		39%	26%
2 ● $\frac{1}{2}$	2		53%	66%
3 ○ $\frac{2}{3}$	3		4%	5%
4 ○ $\frac{3}{5}$	4		2%	2%

COMPUTATION

8. Fractions (+ -) *(13, 17)*

		9	13	17
$\begin{array}{r} 4\frac{1}{2} \\ -\ 2\frac{1}{4} \\ \hline \end{array}$			#35	
1 ○ $1\frac{7}{8}$	1		1%	
2 ○ $1\frac{3}{4}$	2		4%	
3 ○ $2\frac{1}{2}$	3		14%	
4 ● $2\frac{1}{4}$	4		80%	
$\begin{array}{r} 4\frac{1}{4} \\ -\ 2\frac{1}{2} \\ \hline \end{array}$				#2
1 ○ $2\frac{1}{4}$	1			19%
2 ● $1\frac{3}{4}$	2			64%
3 ○ $1\frac{1}{2}$	3			5%
4 ○ $2\frac{1}{2}$	4			12%

COMPUTATION

9. Fractions (x) *(13)*
9. Fractions (x ÷) *(17)*

		9	13	17
Multiply: $4\frac{1}{2} \times 3 =$			*#47*	*#32*
1 ● $13\frac{1}{2}$	1		68%	80%
2 ○ $5\frac{1}{2}$	2		7%	1%
3 ○ $7\frac{1}{2}$	3		9%	5%
4 ○ $\frac{12}{2}$	4		13%	12%
•• Do the following multiplication: $\frac{1}{2} \times \frac{1}{4} =$			*#34*	*#34*
1 ○ $\frac{1}{6}$	1		6%	3%
2 ● $\frac{1}{8}$	2		80%	85%
3 ○ $\frac{4}{2}$	3		6%	5%
4 ○ $\frac{3}{4}$	4		8%	6%
$\frac{2}{3} \times \frac{3}{4} =$			*#38*	
1 ○ $\frac{5}{7}$	1		2%	
2 ● $\frac{1}{2}$	2		79%	
3 ○ $1\frac{7}{12}$	3		7%	
4 ○ $\frac{5}{12}$	4		11%	

COMPUTATION

9. Fraction (x) *(13)*

9. Fractions (x ÷) *(17)*

		9	13	17
Multiply: $\frac{3}{8} \times 2 =$			*#56*	
1○ $\frac{3}{16}$	1		17%	
2○ $\frac{5}{8}$	2		5%	
3○ $\frac{1}{8}$	3		3%	
4● $\frac{6}{8}$	4		73%	
Divide: $\frac{3}{8} \div 2 =$				*#54*
1○ $\frac{3}{4}$	1			19%
2○ $\frac{16}{3}$	2			8%
3○ $\frac{8}{6}$	3			5%
4● $\frac{3}{16}$	4			66%
Divide: $3 \div \frac{3}{4} =$				*#63*
1○ $\frac{4}{9}$	1			4%
2○ $\frac{3}{12}$	2			24%
3○ $\frac{9}{4}$	3			10%
4● 4	4			58%

MEASUREMENT

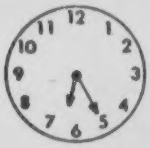
7. Money *(9)*

		9	13	17
A quarter has the same value as how many nickels?		*#5*		
1 ○ 3	1	1%		
2 ● 5	2	92%		
3 ○ 4	3	2%		
4 ○ 6	4	4%		
A nickel has the same value as how many pennies?		*#16*		
1 ○ 1	1	1%		
2 ● 5	2	95%		
3 ○ 4	3	0		
4 ○ 10	4	3%		
A half-dollar has the same value as how many dimes?		*#44*		
1 ○ 25	1	3%		
2 ● 5	2	64%		
3 ○ 10	3	11%		
4 ○ 50	4	21%		
Twenty pennies have the same value as how many nickels?		*#49*		
1 ○ 10	1	11%		
2 ● 4	2	79%		
3 ○ 5	3	6%		
4 ○ 2	4	4%		
A dollar has the same value as how many quarters?		*#60*		
1 ○ 10	1	2%		
2 ○ 25	2	4%		
3 ○ 50	3	6%		
4 ● 4	4	87%		

MEASUREMENT

8. Time *(9)*

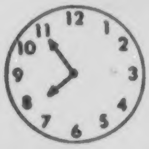
What time does the clock show?



1 ● 6:25
2 ○ 6:35
3 ○ 5:35
4 ○ 6:05

	9	13	17
	#47		
1	83%		
2	3%		
3	9%		
4	3%		

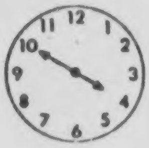
What time does the clock show?



1 ○ 8:05
2 ○ 10:40
3 ○ 11:55
4 ● 7:55

	9	13	17
	#6		
1	34%		
2	3%		
3	5%		
4	58%		

What time is it on this clock?

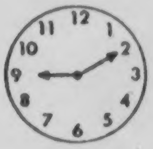
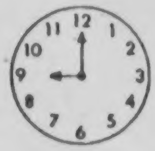


1 ○ 4 minutes after 10
2 ● 10 minutes before 4
3 ○ 20 minutes after 10
4 ○ 20 minutes before 10

	9	13	17
	#24		
1	6%		
2	76%		
3	15%		
4	2%		

MEASUREMENT

8. Time *(9)*

		9	13	17
What time was it two hours ago?  1 ○ 12:45 2 ○ 1:45 3 ● 7:10 4 ○ 9:10		#51		
	1	9%		
	2	3%		
	3	68%		
	4	19%		
What time will it be in one half-hour?  1 ○ 10:00 2 ○ 12:30 3 ● 9:30 4 ○ 1:15		#57		
	1	5%		
	2	2%		
	3	89%		
	4	2%		

MEASUREMENT

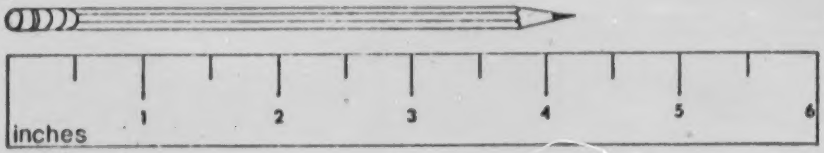
9. Linear Measure *(9)*

		9	13	17
Debbie is in the fourth grade. She is probably about how tall?		*# 7*		
1 ● 50 inches	1	68%		
2 ○ 500 inches	2	4%		
3 ○ 20 inches	3	18%		
4 ○ 200 inches	4	9%		
Which is the BEST unit to measure the length of a toothbrush?		*#30*		
1 ○ foot	1	9%		
2 ● inch	2	87%		
3 ○ yard	3	2%		
4 ○ mile	4	1%		
Which is the BEST unit to measure the distance from New York to Boston?		*#26*		
1 ○ inch	1	1%		
2 ○ yard	2	2%		
3 ○ foot	3	1%		
4 ● mile	4	95%		

MEASUREMENT

9. Linear Measure *(9)*

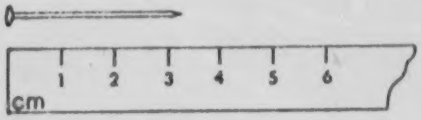
The length of the pencil is nearest to what number of inches?



1 ○ 3 inches
2 ● 4 inches
3 ○ 5 inches
4 ○ 6 inches

	9	13	17
	#33		
1	0		
2	93%		
3	5%		
4	1%		

What is the length of the nail to the nearest centimeter?



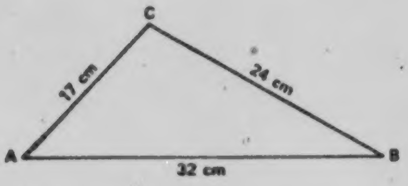
1 ○ 4 cm
2 ● 3 cm
3 ○ 5 cm
4 ○ 6 cm

	9	13	17
	#48		
1	6%		
2	92%		
3	0		
4	1%		

MEASUREMENT

10. Perimeter and Area *(13)*
10. Perimeter, Area and Volume *(17)*

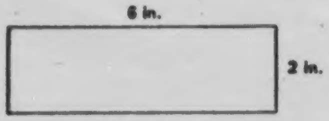
What is the perimeter of triangle ABC?



1○ 24 cm
2○ 41 cm
3○ 56 cm
4● 73 cm

	9	13	17
		#55	
1		3%	
2		4%	
3		9%	
4		82%	

What is the area of the rectangle shown below?



1○ 6 square inches
2○ 8 square inches
3● 12 square inches
4○ 16 square inches

	9	13	17
		#33	
1		2%	
2		12%	
3		56%	
4		30%	

••

A gallon of paint will cover about 250 square feet of surface area. This paint is sold in gallon cans only. How many gallon cans are needed to paint a wall 48 feet long and 10 feet wide?

1○ 20
2● 2
3○ 4
4○ 1

	9	13	17
			#12
1			3%
2			70%
3			15%
4			10%

MEASUREMENT

10. Perimeter and Area *(13)*

10. Perimeter, Area and Volume *(17)*

• ☐

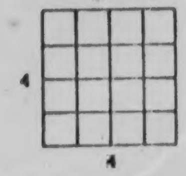
Mr. Simmons put a wire fence all the way around his rectangular garden. The garden is 9 feet long and 5 feet wide. How many feet of fencing did he use?

ANSWER: 28' feet

NAEP SCORING CRITERIA

(1) 28; 28 feet
(2) 45; attempt to multiply 9 x 5
(3) 14; attempt to add 9 and 5
(4) other unacceptable response

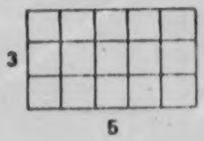
	9	13	17
	#12	#23	#25
1	8%	45%	59%
2	32%	27%	25%
3	43%	16%	7%
4	14%	10%	7%



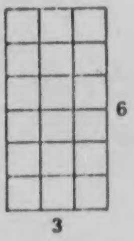
• ☐

Which one of the figures below has the same area as the figure above?

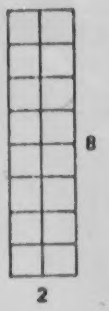
1 ○



2 ○



3 ●



	9	13	17
	#28	#57	
1	37%	13%	
2	5%	2%	
3	54%	84%	

MEASUREMENT

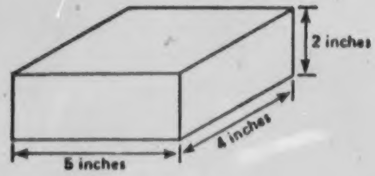
10. Perimeter, Area and Volume *(17)*

The formula for finding the area of a triangle is: $A = \frac{b \times h}{2}$

In a triangle where b = 4 and h = 10, what is the area (A)?

1 ○ 10
2 ● 20
3 ○ 40
4 ○ 80

	9	13	17
			#29
1			1%
2			88%
3			8%
4			2%



Find the volume of the box.

1 ○ 11 cubic inches
2 ○ 24 cubic inches
3 ○ 4 cubic inches
4 ● 40 cubic inches

	9	13	17
			#44
1			14%
2			8%
3			1%
4			75%

MEASUREMENT

11. U.S. Conversion *(13, 17)*

		9	13	17
• 1½ lbs. = ________ ounces ANSWER: 24 NAEP SCORING CRITERIA			#49	#40
(1) 24; 1 1/2 x 16; 48/2	1		58%	74%
(2) garbage	2		0	0
(3) other unacceptable response	3		32%	20%
(4) 15; 15 x 10; 150	4		1%	1%
(5) 3/2; 1.5	5		0	0
(6) 1 lb. 8 oz.	6		0	0
(7) 24 with wrong unit	7		0	0
8 quarts = ______ gallons			#62	#18
1 ○ 1	1		3%	2%
2 ● 2	2		76%	84%
3 ○ 3	3		3%	1%
4 ○ 4	4		17%	13%
How many minutes are equal to 2 hours and 20 minutes?			#40	#64
1 ○ 120 minutes	1		3%	2%
2 ● 140 minutes	2		92%	94%
3 ○ 220 minutes	3		3%	2%
4 ○ 240 minutes	4		2%	2%
•• 30 inches = _______ feet _______ inches			#2	#33
1 ○ 1 foot 6 inches	1		5%	3%
2 ● 2 feet 6 inches	2		86%	92%
3 ○ 3 feet 0 inches	3		4%	2%
4 ○ 3 feet 6 inches	4		4%	3%

MEASUREMENT

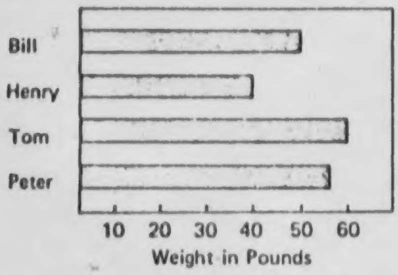
12. Metric Units *(13, 17)*

		9	13	17
Which of the following would generally be BEST to measure the distance between two cities?			*#31*	*#19*
1 ● kilometer	1		73%	77%
2 ○ meter	2		17%	15%
3 ○ centimeter	3		4%	3%
4 ○ millimeter	4		6%	4%
Which of the following is the SMALLEST unit of measurement?			*#44*	*#57*
1 ● milligram	1		68%	73%
2 ○ gram	2		16%	7%
3 ○ centigram	3		10%	12%
4 ○ kilogram	4		6%	7%
The gram is a metric unit that measures:			*#58*	*#31*
1 ● weight	1		85%	93%
2 ○ capacity	2		5%	4%
3 ○ area	3		4%	1%
4 ○ distance	4		4%	2%
The size of this page would BEST be measured in:			*#37*	
1 ○ kilometers	1		3%	
2 ○ milliliters	2		8%	
3 ○ meters	3		11%	
4 ● centimeters	4		77%	
Which of the following would generally be BEST to measure the capacity of a gasoline tank?				*#48*
1 ○ meter	1			6%
2 ● liter	2			86%
3 ○ gram	3			4%
4 ○ kilometer	4			3%

CHARTS & GRAPHS

12. Interpreting Data *(9)*

This graph shows the weight in pounds of four boys.



In the graph above, which boy weighs the most?

1 ○ Bill
2 ○ Henry
3 ● Tom
4 ○ Peter

	9	13	17
	#37		
1	1%		
2	1%		
3	96%		
4	2%		

In the graph above, which boy weighs closest to 50 pounds?

1 ● Bill
2 ○ Henry
3 ○ Tom
4 ○ Peter

	9	13	17
	#38		
1	70%		
2	6%		
3	3%		
4	21%		

In the graph above, which boy weighs the least?

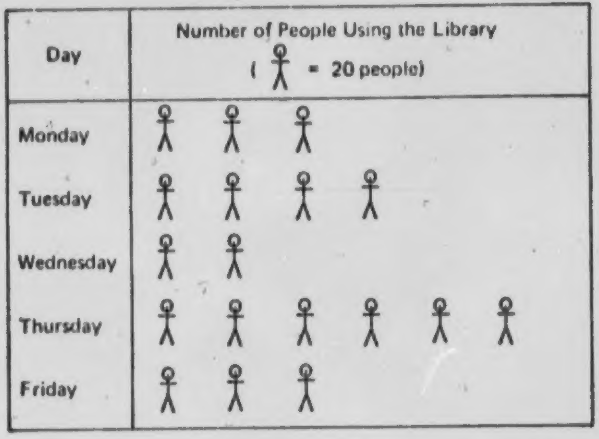
1 ○ Bill
2 ● Henry
3 ○ Tom
4 ○ Peter

	9	13	17
	#39		
1	3%		
2	94%		
3	1%		
4	1%		

CHARTS & GRAPHS

12. Interpreting Data *(9)*

Study the graph and use it to answer the questions which follow.



On which day did the greatest number of people use the library?

		9	13	17
		#17		
1 ○ Monday	1	1%		
2 ○ Tuesday	2	2%		
3 ● Thursday	3	95%		
4 ○ Friday	4	1%		

How many people used the library on Monday?

		9	13	17
		#18		
1 ○ 20	1	2%		
2 ○ 30	2	3%		
3 ○ 3	3	57%		
4 ● 60	4	38%		

CHARTS & GRAPHS

13. Interpreting Data *(13)*

U.S. Rural Population for Nine Regions in 1970

Region	Rural Population (0 = 1 million persons)
1. New England	0 0 0
2. Middle Atlantic	0 0 0 0 0 0 0
3. East North Central	0 0 0 0 0 0 0 0 0 0
4. West North Central	0 0 0 0 0 0
5. South Atlantic	0 0 0 0 0 0 0 0 0 0 0
6. East South Central	0 0 0 0 0 0
7. West South Central	0 0 0 0 0
8. Mountain	0 0
9. Pacific	0 0 0 0

••

According to the chart, which TWO regions of the U.S. had the largest rural populations in 1970?

1 ○ 2. Middle Atlantic and
3. East North Central

2 ○ 1. New England and
8. Mountain

3 ● 5. South Atlantic and
3. East North Central

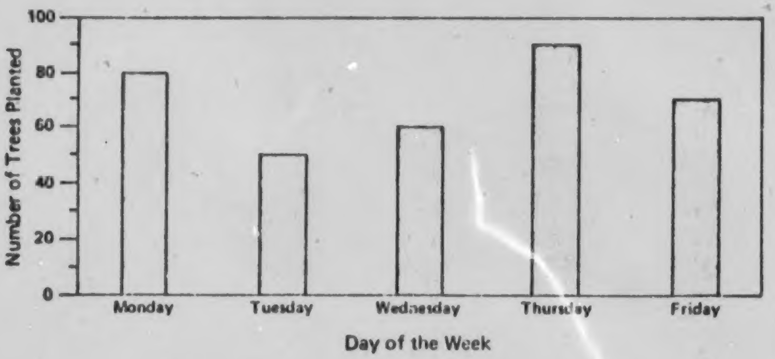
4 ○ 5. South Atlantic and
6. East South Central

	9	13	17
		#53	
1		1%	
2		2%	
3		93%	
4		4%	

CHARTS & GRAPHS

13. Interpreting Data *(13, 17)*

Below is a bar graph that shows the number of trees planted along a highway in a week.



How many trees were planted on Wednesday?

ANSWER: 60

NAEP SCORING CRITERIA

(1) 58-62
(2) garbage
(3) other unacceptable response

	9	13	17
		#65	*#13*
1		92%	95%
2		0	0
3		8%	4%

Size Table for Socks

Shoe Size	Sock Size	Shoe Size	Sock Size
6-6½	9½	9-9½	11
7-7½	10	10-10½	11½
8-8½	10½	11-11½	12

According to the table, what size socks should you buy if you wear size 10 shoes?

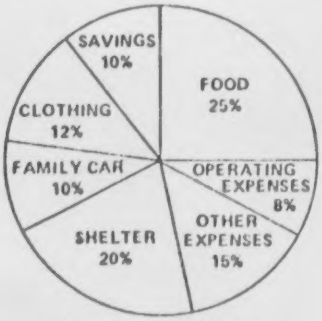
1 ○ 7
2 ○ 7½
3 ○ 10
4 ○ 10½
5 ○ 11
6 ● 11½

	9	13	17
		#46	*#11*
1		1%	0
2		1%	1%
3		4%	2%
4		3%	2%
5		2%	1%
6		88%	94%

CHARTS & GRAPHS

13. Interpreting Data *(13, 17)*

According to the graph, on what did the Harris family spend the LEAST amount of money?



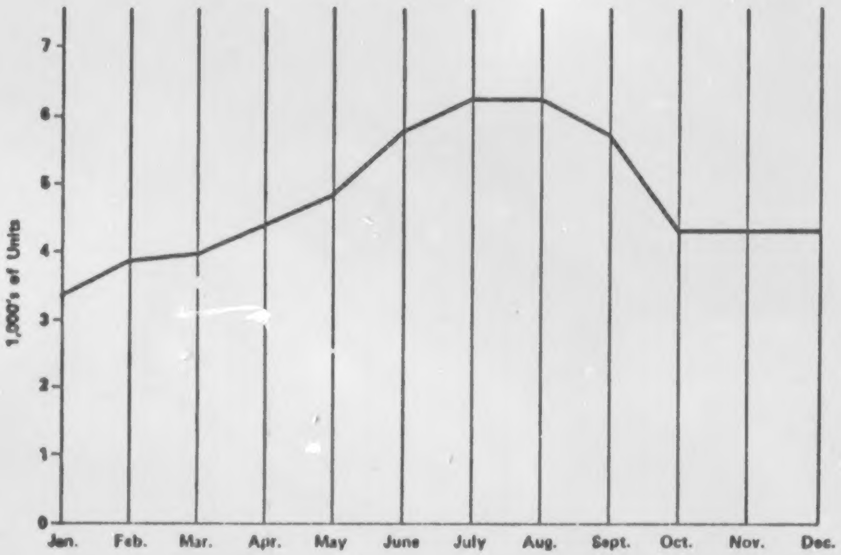
The Harris Family Budget

1 ● operating expenses
2 ○ savings
3 ○ other expenses
4 ○ food

	9	13	17
		#41	*#21*
1		87%	96%
2		2%	1%
3		2%	1%
4		9%	2%

CHARTS & GRAPHS

13. Interpreting Data *(17)*



MONTHLY PRODUCTION IN 1,000'S OF UNITS – 1971

**

The greatest drop in production from one month to the next occurred between what two months?

1 ○ August to September
2 ○ April to May
3 ○ May to June
4 ● September to October

	9	13	17
			#50
1			4%
2			1%
3			1%
4			93%

PROBLEM SOLVING

10. Math Problems *(9)*

		9	13	17
Dorothy washes windows at the rate of five minutes per window. To figure out how many minutes it will take her to wash ten windows, she could:		*#1*		
1 ○ add 5 and 10	1	20%		
2 ○ divide 10 by 5	2	11%		
3 ● multiply 5 by 10	3	61%		
4 ○ subtract 5 from 10	4	7%		
Marcus gave the cashier a $5 bill for a $1.40 purchase. How much money did he receive in change?		*#46*		
1 ○ $2.60	1	9%		
2 ○ $3.40	2	8%		
3 ● $3.60	3	39%		
4 ○ $4.60	4	42%		
Bob picked 8 apples from an apple tree, John picked 17 apples, and Larry picked 37. How many apples did they pick in all?		*#54*		
1 ● 62	1	82%		
2 ○ 52	2	7%		
3 ○ 55	3	5%		
4 ○ 422	4	5%		

PROBLEM SOLVING

10. Math Problems *(9)*

• ☐

A rocket was directed at a target 525 miles south of the launching point. It landed 624 miles south of the launching point. By how many miles did it miss its target?

ANSWER: 99

NAEP SCORING CRITERIA

(1) 99; 99 miles
(2) correct process with no answer or wrong answer; 624-525 = 109
(3) 1149; any attempt to add
(4) 109 with no work shown
(5) 101 with no work shown
(6) other unacceptable response

	9	13	17
	#19	*#52*	
1	39%	81%	
2	5%	3%	
3	14%	2%	
4	2%	1%	
5	13%	6%	
6	22%	6%	

•

Betty's dog eats two biscuits every day. How many days will it take the dog to finish the package of 24 biscuits?

ANSWER: 12

NAEP SCORING CRITERIA

(1) 12; 12 days
(2) 12 with wrong units (biscuits)
(3) 2402; attempt to divide 24 by 2
(4) 22; attempt to subtract 2 from 24
(5) 26; attempt to add 24 and 2
(6) 48; attempt to multiply 24 by 2
(7) 24
(8) other unacceptable response

	9	13	17
	#23		
1	51%		
2	0		
3	0		
4	6%		
5	4%		
6	15%		
7	2%		
8	20%		

PROBLEM SOLVING

11. Real World Problems *(9)*

		9	13	17
•• If you have two nickels, one quarter and four pennies, how much money do you have all together?		#50		
1 ● 39¢	1	81%		
2 ○ 7¢	2	2%		
3 ○ 59¢	3	8%		
4 ○ 34¢	4	8%		
•• Sally worked from 4:25 P.M. to 5:00 P.M. How many minutes did she work?		#35		
1 ○ 25 minutes	1	9%		
2 ● 35 minutes	2	45%		
3 ○ 1 hour and 25 minutes	3	23%		
4 ○ 75 minutes	4	21%		
John found shirts on sale at $2.00 each. He decided to buy seven shirts. How much money did he spend?		#9		
1 ○ $9.00	1	7%		
2 ○ $12.00	2	5%		
3 ● $14.00	3	85%		
4 ○ $16.00	4	3%		

PROBLEM SOLVING

11. Real World Problems *(9)*

• ☐

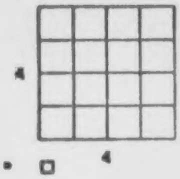
Mr. Simmons put a wire fence all the way around his rectangular garden. The garden is 9 feet long and 5 feet wide. How many feet of fencing did he use?

ANSWER: 28 feet

NAEP SCORING CRITERIA

(1) 28; 28 feet
(2) 45; attempt to multiple 9 x 5
(3) 14; attempt to add 9 and 5
(4) other unacceptable response

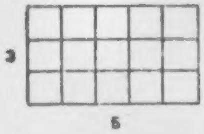
	9	13	17
	#12	*#23*	*#25*
1	8%	45%	59%
2	32%	27%	25%
3	43%	16%	7%
4	14%	10%	7%



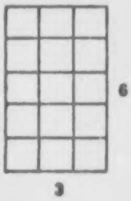
• ☐

Which of the figures below has the same area as the figure above?

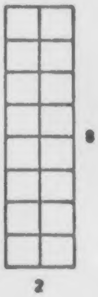
1 ○



2 ○



3 ●



	9	13	17
	#28	*#57*	
1	37%	13%	
2	5%	2%	
3	54%	84%	

PROBLEM SOLVING

14. Math Problems *(13, 17)*

•

Marie took four spelling tests. Each test had 30 words. On the four tests she spelled correctly the following numbers of words:

25, 23, 27, and 24.

Altogether, how many words did she MISS on all four tests?

ANSWER: 21

NAEP SCORING CRITERIA

(1) 21; 21 words
(2) correct process, subtracts then adds
(3) correct process, adds then subtracts
(4) 99; 99 words attempt to add
(5) 4, 4 words
(6) other unacceptable response

	9	13	17
		#48	
1		76%	
2		2%	
3		1%	
4		3%	
5		1%	
6		16%	

•

Last summer Todd earned $205, Charlotte earned $562, and Dale earned $400. What is the average of their summer incomes?

ANSWER: $ 389.00

NAEP SCORING CRITERIA

(1) 389.00; 389
(2) 400.00; 400
(3) correct process with no or wrong answer
(4) 1167.00 (can change decimal); any attempt to add
(5) other unacceptable response

	9	13	17
		#51	#16
1		56%	72%
2		1%	1%
3		5%	2%
4		24%	11%
5		11%	12%

PROBLEM SOLVING

14. Math Problems *(13, 17)*

•

In a school election with three candidates, Joe received 120 votes, Mary received 50 votes, and George received 30 votes. What percent of the total number of votes did Joe receive?

ANSWER: 60 %

NAEP SCORING CRITERIA

(1) 60
(2) correct process, no answer or wrong answer
(3) equal fraction: e.g., 120/200
(4) 5/3; 1.67; attempt to divide 200/120
(5) 80; 4/5; 40; 2/5
(6) other unacceptable response
(7) 120
(8) 66 2/3; 66; 67; 200/3; 80/120

	9	13	17
		#10	*#8*
1		27%	46%
2		1%	0
3		3%	1%
4		0	0
5		13%	11%
6		30%	29%
7		12%	3%
8		7%	5%

•

If there are 300 calories in nine ounces of a certain food, how many calories are there in a three-ounce portion of that food?

ANSWER: 100

NAEP SCORING CRITERIA

(1) 100; 100 calories
(2) correct process with no answer or wrong answer; 300/9 = x/3
(3) 900; 900 calories
(4) other unacceptable response

	9	13	17
			#27
1			79%
2			0
3			3%
4			14%

PROBLEM SOLVING

14. Math Problems *(13, 17)*

•

A worker went to his job at 7:45 A.M. and returned home exactly 10 hours later. At what time did he reach home?

ANSWER: 5:45 P.M.

NAEP SCORING CRITERIA

(1) 5:45; 17:45
any written equivalent
(2) 5:45 a.m.; 545
(3) 7:55; 755
(4) 4:45; 445; 4:45 a.m.
(5) other unacceptable response

	9	13	17
		#26	*#43*
1		80%	87%
2		0	1%
3		3%	0
4		4%	3%
5		13%	8%

• ☐

A rocket was directed at a target 525 miles south of its launching point. It landed 624 miles south of the launching point. By how many miles did it miss its mark?

ANSWER: 99 miles

NAEP SCORING CRITERIA

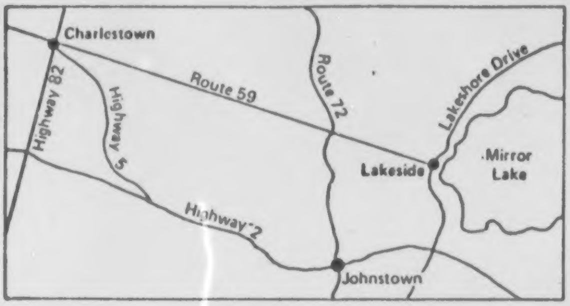
(1) 99; 99 miles
(2) correct process with no answer
or wrong answer; 624 - 525 = 109
(3) 1149; any attempt to add
(4) 109 with no work shown
(5) 101 with no work shown
(6) other unacceptable response

	9	13	17
	#19	*#52*	
1	39%	81%	
2	5%	3%	
3	14%	2%	
4	2%	1%	
5	13%	6%	
6	22%	6%	

PROBLEM SOLVING

15. Real World Problems *(13)*

On a map the distance from Charlestown to Lakeside is 3 inches. The map scale is 1 inch = 45 miles. What is the actual distance?


Charlestown
Highway 82
Highway 5
Route 59
Route 72
Lakeshore Drive
Lakeside
Mirror Lake
Highway 2
Johnstown

1○ 15 miles

2● 135 miles

3○ 66 $\frac{2}{3}$ miles

4○ 666 $\frac{2}{3}$ miles

	9	13	17
		#28	
1		3%	
2		95%	
3		1%	
4		0	

PROBLEM SOLVING

15. Real World Problems *(13, 17)*

••

If John drives at an average speed of 50 miles an hour, how many hours will it take him to drive 275 miles?

1 ● 5½ hours
2 ○ 5 hours 25 minutes
3 ○ 19½ hours
4 ○ 5¼ hours

	9	13	17
		#54	#58
1		51%	58%
2		36%	24%
3		4%	2%
4		8%	15%

A sales tax rate is 6%. What is the tax on a $200 TV set?

1 ○ $1.20
2 ○ $3.00
3 ○ $3.33
4 ● $12.00

	9	13	17
		#64	#30
1		10%	3%
2		9%	3%
3		17%	13%
4		60%	80%

•

Television sets are on sale at two stores. One offers a 10 percent discount while the other offers 15 percent. What is the difference in the sale price at the two stores of a TV set that is regularly priced at $100?

ANSWER: $ 5.00

NAEP SCORING CRITERIA

(1) 5.00; 5; 85.90; 5% of 100
(2) 25; 25%
(3) 15; 10; 10%; 15%
(4) other unacceptable response

	9	13	17
		#11	
1		61%	
2		2%	
3		4%	
4		21%	

A sales tax is 3¢ on each dollar. What is the tax on a purchase that costs $10.00?

1 ○ 3¢
2 ○ 13¢
3 ● 30¢
4 ○ 33¢

	9	13	17
		#30	
1		0	
2		2%	
3		95%	
4		3%	

PROBLEM SOLVING

15. Real World Problems *(17)*

•

A parking lot charges 35 cents for the first hour and 25 cents for each additional hour or fraction of an hour. For a car parked from 10:45 in the morning until 3:05 in the afternoon, how much money should be charged?

ANSWER: $ 1.35

NAEP SCORING CRITERIA

(1) 1.35
(2) 1.10; 110
(3) 1.25; 125
(4) 1.60; 160
(5) 1.75; 175
(6) 1.95; 195
(7) 2.10; 210
(8) other unacceptable response

	9	13	17
			#41
1			54%
2			6%
3			1%
4			9%
5			1%
6			0
7			2%
8			23%

•

An automobile can be bought for cash for $2,850 or on credit with a down payment of $400 and $80 a month for three years. How much MORE would a person pay by buying on credit than by buying the car for cash?

ANSWER: $ 430

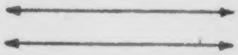
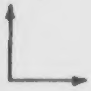
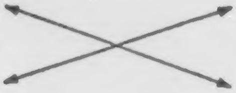
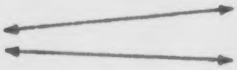
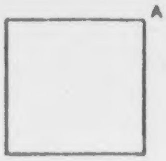
NAEP SCORING CRITERIA

(1) 430; 430 with wrong unit
(2) correct process with add/mult error; any decimal of 430
(3) 3280-2850 with subtract error
(4) 3280; decimal of 3280; attempt to solve (36 x 80) + 400
(5) 30; attempt to solve (36 x 80) - 2850
(6) attempt to multiply by wrong number of months
(7) other unacceptable response

	9	13	17
			#39
1			57%
2			2%
3			0
4			1%
5			6%
6			1%
7			27%

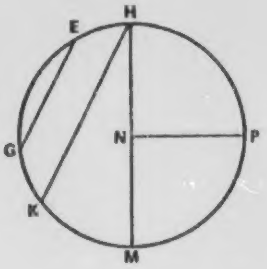
GEOMETRY

16. Concepts *(13)*

		9	13	17
Which picture below shows parallel lines?			*# 4*	
1 ● 	1		94%	
2 ○ 	2		1%	
3 ○ 	3		2%	
4 ○ 	4		2%	
				
Angle A is what kind of an angle?			*#39*	
1 ○ acute	1		12%	
2 ○ obtuse	2		6%	
3 ● right	3		71%	
4 ○ straight	4		10%	
Which of the following has a shape MOST like an orange?			*#45*	
1 ○ cone	1		2%	
2 ○ cube	2		2%	
3 ○ cylinder	3		13%	
4 ● sphere	4		83%	

GEOMETRY

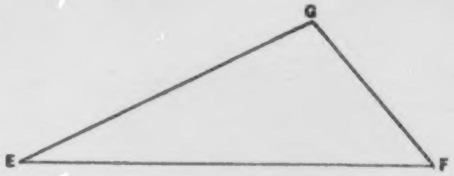
16. Concepts *(13, 17)*



Which line segment is a DIAMETER?

1 ○ EG
2 ○ HK
3 ● HM
4 ○ NP

	9	13	17
		#13	
1		2%	
2		5%	
3		74%	
4		18%	



If the measure of angle F is 50° and the measure of angle G is 105°, what is the measure of angle E?

ANSWER: 25°

NAEP SCORING CRITERIA

(1) 25 (must have degrees sign)
(2) 25 (no sign for degrees)
(3) 90 with/without degrees sign
(4) 155; 55 with/without degrees
(5) 45; 205 with/without degrees
(6) other unacceptable response; e.g. acute

	9	13	17
			#42
1			52%
2			9%
3			1%
4			9%
5			4%
6			17%

GEOMETRY

16. Concepts *(17)*

•

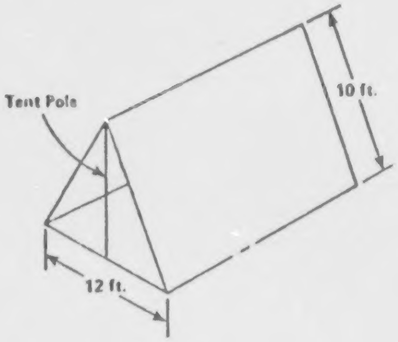
What is the measure in degrees of the angle formed by the hands of the clock when the time is three o'clock?

ANSWER: 90°

NAEP SCORING CRITERIA

(1) 90 with/without degrees sign
(2) 270 with/without degrees sign
(3) 90 percent; 90 with mislabel
(4) 3 o'clock
(5) 45 with/without degrees sign
(6) other unacceptable response
(7) 1/4 of circle; 1/4 of turn; 1/4

	9	13	17
			#5
1			72%
2			0
3			0
4			1%
5			12%
6			9%
7			1%



•

To set up a tent having the dimensions shown in the drawing, the vertical tent poles used should be how many feet high?

ANSWER: 8 feet

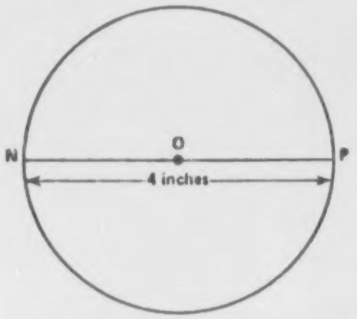
NAEP SCORING CRITERIA

(1) 8; 64 under radical
(2) correct processing; no answer or wrong answer
(3) any attempt to find square root of 10 square + 6 square; 136 under radical
(4) attempt to find square root 12 square + or - 10 square
(5) 4
(6) 10; 16
(7) 12; 11
(8) other unacceptable response

	9	13	17
			#23
1			39%
2			0
3			1%
4			0
5			1%
6			30%
7			10%
8			15%

GEOMETRY

16. Concepts *(17)*



The distance around this circle is ABOUT:

1 ○ 8 inches
2 ○ 10 inches
3 ● 12 inches
4 ○ 16 inches

	9	13	17
			#60
1			23%
2			3%
3			32%
4			40%

APPENDIX B

Percentage of 9-, 13-, and 17-Year-Olds in Connecticut by Sex of Student, in Each Region, and in Each Size of Community Answering Correctly Each Test Item

TABLE B.1

Test Item Performance of 9-Year-Old Fourth-Graders in Connecticut by Sex of Student, in Each Region, and in Each Size of Community with National (NAEP) Results Where Applicable

Question Number	Description of Item	Percentage of Students Answering Correctly														
		Connecticut														Nation
		All Students	Sex		Region*						Size of Community					
			M	F	1	2	3	4	5	6	1	2	3	4		
1	At rate of 5 minutes per window, how could one figure how many minutes to wash 10 windows	61	62	61	59	70	68	58	64	61	48	66	60	66		50
2	Fractional part of rectangle shaded (¼)	61	59	62	60	73	63	61	64	51	47	64	59	67		
3	4613 x 5 =	78	74	82	79	84	75	79	86	60	76	82	74	80		
4	Which is greatest (4-digit numbers ending in 00)	87	89	86	93	90	89	90	88	88	76	90	90	90		
5	A quarter equals how many nickels	92	93	91	94	94	93	92	94	90	86	92	93	94		
6	Time shown on clock (7:55)	59	63	55	62	70	63	54	58	57	46	61	60	62		
7	Estimate height of girl in fourth grade	68	72	65	74	74	69	71	74	68	52	71	69	75		
8	Identify digit in tens place	79	80	79	83	81	85	81	81	89	62	82	80	86		75
9	At $2 per shirt, how much would 7 shirts cost	85	86	84	87	91	87	86	87	81	76	88	85	88		
10	Which is greatest (5-digit numbers)	65	66	64	69	70	70	65	64	63	51	68	69	66		
11	402 x 7 =	68	65	70	69	74	67	69	78	51	56	73	68	70		
12**	Feet of fencing to enclose garden 9 feet long, 5 feet wide	8	11	6	8	12	9	7	12	6	4	10	7	11		7
13**	1054 - 865 =	51	48	53	57	59	51	56	52	43	37	54	51	56		27
14	Place values in 762	81	82	80	85	83	87	81	87	79	64	84	84	86		74
15	Which number is least (whole numbers)	83	83	83	86	86	84	86	86	82	73	86	83	37		
16	A nickel equals how many pennies	95	95	95	96	96	97	97	98	94	88	96	96	98		
17	Pictograph—on which day did most people use library	95	94	96	97	97	97	95	98	97	86	96	95	99		
18	Pictograph—how many people used library on specific day (symbol = 20 people)	38	40	36	43	43	47	33	46	42	15	39	40	47		
19	Rocket aimed at target 525 miles south, landed 624 miles south. Missed target by how many miles	39	40	39	43	48	44	45	43	31	19	43	43	45		22
20**	38 + 19 =	89	87	90	89	91	92	90	92	82	82	91	89	91		79

21**	36 - 19 =	77	76	79	83	82	80	76	83	75	64	79	79	82	55
22**	$3.06 + 10.00 + 9.14 + 5.10 =	48	47	49	46	55	53	56	56	35	30	49	53	54	40
23**	At 2 biscuits per day, how long until dog eats 24 biscuits	51	55	47	55	57	54	51	59	44	33	54	52	57	37
24	Time shown on clock (10 to 4)	76	76	75	82	77	79	76	80	71	63	75	77	81	
25	Sum of hundreds, tens, ones	78	80	77	82	84	84	81	80	72	63	84	80	82	
26	Best unit to measure between two cities	95	96	94	96	97	94	96	97	90	91	97	94	96	
27	Fractional part of circle shaded (¼)	63	62	64	64	74	65	64	69	49	50	67	65	67	
28	Figure which has the same area as figure shown (all rectangles)	54	57	51	53	66	54	52	53	44	48	55	55	55	38
29	659 - 207 =	88	88	89	89	90	91	90	92	81	80	89	90	91	
30	Best unit to measure toothbrush	87	88	86	89	91	89	87	89	89	77	89	87	90	
31	36 x 3 =	81	79	82	79	87	82	85	88	71	70	85	77	86	
32	826 + 756 =	87	85	88	86	92	87	88	90	85	79	88	88	89	
33	Length of pencil to nearest inch	93	93	92	92	95	94	96	96	86	85	94	93	96	
34	312 x 4 =	89	87	91	90	91	89	93	94	81	82	92	89	91	
35	From 4:25 to 5:00 P.M. is how many minutes	45	51	40	49	52	49	42	44	36	36	47	47	47	
36	Fraction of dots colored in (⁴⁄₇)	73	72	74	73	82	78	74	77	74	57	77	74	79	
37	Bar graph—who weighs most	96	96	95	98	97	97	97	99	97	87	96	98	97	89
38	Bar graph—who weighs closest to 50 pounds	70	74	66	71	74	74	73	76	68	52	72	72	76	61
39	Bar graph—who weighs least	94	95	94	97	96	98	96	98	97	83	97	96	98	84
40	63 x 3 =	89	88	90	90	93	88	92	95	83	81	93	86	92	
41	Fractional part of circle shaded (⅔)	72	70	73	70	81	76	75	74	65	57	77	70	77	
42	Next number after 98, 99, 100,	95	94	95	98	97	96	97	98	93	85	97	96	97	
43	Place value of 7 in 7000	78	79	76	76	83	82	80	81	81	64	80	81	81	
44	A half dollar equals how many dimes	64	69	60	66	70	71	63	71	67	46	65	68	71	
45	476 - 38 =	76	73	79	80	81	82	75	77	71	63	81	75	81	
46	Amount of change from $5 for a $1.40 purchase	39	38	41	39	45	42	39	47	33	26	39	41	45	
47	Time shown on clock (6:25)	83	86	81	82	90	87	81	85	83	73	85	84	87	
48	Length of nail to nearest centimeter	92	93	92	92	94	93	96	97	88	84	93	94	95	
49	Twenty pennies equal how many nickels	79	80	78	80	84	84	80	88	71	62	83	82	83	
50	2 nickels, 1 quarter, and 4 pennies equal how much money	81	80	83	85	86	85	81	85	71	71	84	83	84	
51	Time it was two hours ago	68	70	65	67	73	75	69	77	75	45	71	67	78	
52	Fractional part of rectangle shaded (⁴⁄₁₀)	63	61	64	57	72	68	65	68	56	50	65	63	68	
53	634 + 41 + 5122 =	91	89	92	91	94	92	92	95	90	83	93	92	93	
54	Total of 8 apples, 17 apples, and 37 apples	82	80	83	83	85	83	86	87	74	71	83	82	86	
55	Value of 4 in 3654	80	81	79	86	84	86	84	86	79	57	86	82	87	
56	861 - 583 =	75	72	77	79	82	77	77	76	71	60	79	75	79	
57	Time it will be in one-half hour	89	91	88	89	93	92	91	94	93	78	91	91	94	
58	Number 10 more than 4375	59	64	55	63	66	64	61	63	49	40	64	59	65	
59	725 + 203 =	93	91	94	92	96	95	93	95	93	87	94	94	95	
60	A dollar equals how many quarters	87	89	85	91	91	90	86	90	88	73	90	90	89	

* Regions do not include "Big Cities."

** Open-ended item.

TABLE B.2

Test Item Performance of 13-Year-Old Eighth-Graders in Connecticut by Sex of Student, in Each Region, and in Each Size of Community with National (NAEP) Results Where Applicable

Question Number	Description of Item	Percentage of Students Answering Correctly													
		Connecticut													Nation
		All Students	Sex		Region *						Size of Community				
			M	F	1	2	3	4	5	6	1	2	3	4	
1**	38 x 9 =	87	85	88	87	88	86	89	86	88	81	86	87	89	83
2	30 inches = __ feet __ inches	86	90	93	86	86	89	88	89	88	67	87	86	91	
3**	38 + 19 =	96	95	96	97	95	96	96	95	94	93	96	96	96	94
4	Picture of parallel lines	94	96	93	93	95	96	96	96	85	82	96	93	96	
5	13 boys and 15 girls in a group, what fractional part is boys	32	33	32	28	32	36	34	33	36	25	34	30	35	
6	.009 is equivalent to what fraction	70	70	69	71	69	73	72	66	73	55	70	70	73	
7	Which number is least (whole numbers)	98	98	98	98	99	98	98	97	99	96	98	97	99	
8	826 + 786 =	97	96	97	99	97	97	96	96	99	96	97	96	97	
9**	36 - 19 =	93	93	93	93	94	93	95	91	93	90	94	92	94	89
10**	Several people received votes, what percentage of total vote did one of the people receive	27	33	23	26	34	32	24	27	19	15	30	24	30	17
11**	At 10% and 15% discount, what is the difference in prices for TV set regularly priced at $100	61	65	57	56	65	64	62	64	57	45	63	60	63	49
12**	1054 - 865 =	87	87	87	89	86	87	89	87	90	77	88	86	89	80
13	Line segment in a circle which is the diameter	74	78	70	74	78	76	75	68	69	60	76	73	74	68
14	Fraction that is greatest	30	40	22	29	33	36	29	28	21	16	31	26	37	26
15	714 : 7 =	74	73	74	72	79	73	76	72	61	66	74	75	74	
16	46 x 50 =	95	94	96	94	97	95	96	94	94	88	96	94	95	
17	0.6 + 8 + .24 =	83	85	81	82	89	85	84	82	67	67	84	84	84	
18	Fractional part of circle shaded	93	93	94	91	96	96	95	91	87	82	95	92	95	
19	Number that is greatest (decimals)	86	91	81	86	92	89	86	80	79	69	89	83	88	84
20	74 x 38 =	89	87	90	87	92	90	91	86	88	80	90	88	91	
21	$8.96 : 4 =	91	90	92	91	92	93	91	88	91	86	92	89	93	
22	$\frac{1}{2} + \frac{1}{3}$ =	60	59	60	61	69	60	61	56	61	37	61	58	66	
23**	Feet of fencing to enclose garden 9 feet long and 5 feet wide	45	53	38	40	49	51	47	41	40	27	47	44	48	
24**	$3.06 + 10.00 + 9.14 + 5.10 =	88	87	89	87	93	91	88	86	93	76	91	86	90	84
25**	$\frac{1}{5}$ is equivalent to what percent	55	60	50	52	59	63	53	51	58	30	59	50	61	41
26**	Person left for work at 7:45 A.M., returned home 10 hours later at what time	80	82	78	82	81	83	80	79	69	63	83	78	82	63
27**	125 : 5 =	94	93	94	95	97	94	94	91	87	87	95	92	95	89
28	Distance on map is 3 inches. At scale of 1 inch = 45 miles, what is actual distance between the cities	95	96	94	97	96	96	96	94	97	85	96	95	97	

29	4.2 x 0.3 =	70	68	72	74	80	69	71	66	73	51	75	64	77	
30	Sales tax of 3 cents on a dollar, what is tax on a $10 purchase	95	95	94	95	96	96	94	94	94	88	96	95	95	
31	Metric unit used to measure distance between two cities	73	82	65	78	81	75	75	65	54	54	77	70	76	
32	609 x 73 =	91	90	92	92	95	91	91	91	94	85	93	91	93	
33	Area of rectangle shown (6 inches by 2 inches)	56	58	54	63	64	59	52	53	45	36	59	49	64	
34	½ x ¼ =	80	78	81	79	82	79	79	80	87	77	80	77	82	
35	4½ - 2¼ =	80	78	82	79	86	82	80	83	79	64	81	82	82	
36	425 x 0.33 =	86	86	86	89	88	85	89	83	88	74	90	83	87	
37	Metric unit used to measure page of test	77	81	74	79	84	79	79	73	72	54	81	75	81	
38	[illegible] x ¼ =	74	80	78	73	84	81	81	80	82	64	81	76	84	
39	Kind of angle found in a square	71	72	69	76	74	74	73	66	49	46	72	71	75	
40	2 hours 20 minutes = __ minutes	93	95	91	92	95	95	94	91	93	79	94	92	96	
41	Reading a circle graph	87	88	87	88	89	89	89	86	84	78	89	86	90	
42	$1.98 x 4 =	92	92	92	94	94	92	92	95	91	85	92	92	94	
43	$1.29 x 0.06 =	57	56	58	60	62	57	60	51	63	38	63	51	60	
44	Smallest metric unit of measurement	68	75	63	67	79	73	71	62	51	40	74	64	73	
45	Shape most like an orange (sphere)	83	86	80	88	85	83	86	78	67	67	83	83	85	
46	Reading a table of sock sizes	[illegible]	88	88	90	93	89	91	86	82	69	91	87	91	
47	4½ x 3 =	68	71	66	70	74	70	68	69	64	49	72	65	72	
48**	Mary took four tests and received four different numbers of items correct. How many items were incorrect	76	77	76	75	81	79	78	76	63	61	79	76	78	60
49**	1½ pounds = __ ounces	58	66	50	52	57	62	62	58	52	41	60	56	61	
50**	If 23.8 is subtracted from 62.1	72	72	72	73	77	76	74	69	64	54	74	71	76	61
51**	Three people earned money. What was average amount earned	56	59	53	61	64	60	58	46	40	31	61	53	59	38
52**	Rocket aimed at target missed target by how many miles	81	82	81	80	88	84	82	79	76	64	85	78	84	72
53	Reading a chart with symbol for a kind of unit	93	93	93	94	94	93	92	92	88	87	93	92	94	
54	At average speed of 50 MPH, how many hours to travel 275 miles	51	59	44	46	52	57	54	46	40	34	54	49	52	
55	Perimeter of triangle shown (17 cm by 24 cm by 32 cm)	82	84	80	82	83	83	82	84	75	72	81	82	86	
56	⅜ x 2 =	73	73	73	72	75	74	76	75	69	58	76	71	76	
57	Figure which has same area as figure shown (all rectangles)	84	84	84	86	89	86	83	80	79	74	89	81	84	
58	Gram is used to measure (weight)	85	89	82	87	89	87	88	82	72	68	90	82	86	
59	⅚ - ⅓ =	53	53	54	58	62	53	53	55	46	31	57	51	58	
60	339 ÷ 22 =	84	82	85	86	85	85	84	82	78	73	84	84	85	
61	$10.00 - 1.98 =	85	86	84	88	89	86	84	82	85	78	86	85	86	
62	8 quarts = __ gallons	76	82	71	73	79	81	77	75	73	62	79	74	79	
63	2¾ + 3⅞ =	64	65	63	62	73	65	66	64	64	40	67	61	68	
64	Sales tax of 6%, what is tax on $200 TV set	60	64	56	59	59	64	60	57	63	53	60	61	61	
65**	Reading a bar graph	92	91	92	93	91	93	93	89	90	84	93	91	93	
66	Ordering fractions	32	39	26	30	35	37	31	30	25	18	34	32	33	

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* Regions do not include "Big Cities."
** Open-ended item.

TABLE B.3

Test Item Performance of 17-Year-Old Eleventh-Graders in Connecticut by Sex of Student, in Each Region, and in Each Size of Community with National (NAEP) Results Where Applicable

Question Number	Description of Item	Percentage of Students Answering Correctly													
		Connecticut													Nation
		All Students	Sex		Region*						Size of Community				
			M	F	1	2	3	4	5	6	1	2	3	4	
1	714 ÷ 7 =	77	79	76	79	78	77	81	81	75	66	79	77	80	
2	$4\frac{1}{4} - 2\frac{1}{2}$ =	64	72	57	68	67	67	61	66	71	46	63	67	68	
3	0.6 + 8 + .24 =	87	88	87	87	94	90	83	89	92	75	88	90	89	
4**	38 x 9 =	88	87	89	89	88	90	86	90	83	86	89	89	88	88
5**	Degrees of angle formed by hands of clock at 3 o'clock	72	78	67	79	77	79	67	74	65	52	75	76	75	73
6**	38 + 19 =	97	97	97	97	98	97	95	98	99	97	97	97	97	97
7**	$\frac{1}{5}$ is equivalent to what percent	63	68	60	65	74	67	62	59	71	45	68	64	66	65
8**	Several people received votes, what percentage of total vote did one of the people receive	46	59	36	47	53	50	45	46	54	30	47	51	47	45
9	Fraction describing shaded portion of figure	86	86	86	85	88	88	86	87	86	81	88	86	87	
10	339 ÷ 22 =	91	91	91	92	93	94	91	91	94	81	94	93	91	
11	Reading a table of sock sizes	94	93	94	94	97	96	95	95	99	83	96	96	95	
12	One gallon of paint covers 250 square feet, how many gallons are needed to cover a wall 48 feet by 10 feet	70	77	65	77	76	77	66	70	72	51	72	74	75	
13**	Reading a bar graph	91	93	89	91	92	92	90	93	94	85	93	91	91	
14**	36 - 19 =	95	95	95	94	97	96	96	95	95	92	96	97	95	92
15**	$3.06 + 10.00 + 9.14 + 5.10 =	94	93	95	95	96	93	92	95	94	92	94	95	94	93
16**	Three people earned money. What was the average amount earned	72	76	79	73	77	78	72	77	83	51	73	76	78	66
17**	125 ÷ 5 =	95	94	95	97	97	95	93	96	92	91	96	95	95	93
18	8 quarts = __ gallons	84	89	80	86	82	86	86	87	92	71	84	88	85	
19	Metric unit used to measure distance between two cities	77	87	69	80	84	82	72	80	74	57	76	80	82	
20	609 x 73 =	95	96	95	96	94	95	95	98	97	91	94	96	97	
21	Reading a circle graph	96	95	96	96	97	97	95	96	100	89	97	97	96	
22	Ordering fractions	57	70	46	60	63	62	54	57	66	37	58	57	63	
23**	Height of tent pole (use of right triangle)	39	47	33	41	51	44	34	36	43	23	42	40	42	34
24**	If 23.8 is subtracted from 62.1	84	82	86	89	88	86	84	85	88	72	86	86	87	78
25**	Feet of fencing to enclose garden 9 feet long and 5 feet wide	59	71	50	62	63	63	60	64	71	34	59	62	66	
26**	1054 - 865 =	92	91	93	94	93	95	91	93	95	86	92	94	94	89

27**	If 300 calories in 9 ounces of a food, how many calories in 3 ounces of the food	79	82	77	82	80	85	79	81	88	62	81	81	84	70
28	826 + 786 =	95	95	95	97	97	95	96	94	97	91	97	96	95	
29	Given formula for area of triangle, find area of triangle with b = 4 and h = 10	88	88	88	91	94	90	87	89	99	72	90	90	91	
30	Sales tax of 6%, what is tax on $200 TV set	80	82	78	86	79	82	79	78	86	72	81	80	81	
31	Gram is used to measure (weight)	93	97	91	95	95	95	94	96	95	82	95	96	95	
32	4½ x 3 =	80	85	77	85	85	83	80	82	85	62	82	85	83	
33	30 inches = __ feet __ inches	92	94	90	95	95	95	92	95	94	77	94	94	95	
34	½ x ¼ =	85	83	86	86	86	83	85	84	95	83	87	84	84	
35	.009 is equivalent to what fraction	74	78	70	75	80	78	73	73	79	58	79	73	76	
36	$74.46 ÷ 17 =	88	83	88	89	90	91	87	90	88	78	89	89	89	
37	$10.00 - 1.98 =	90	91	90	92	91	93	88	91	92	85	89	92	92	
38	$1.29 x 0.06 =	71	70	72	76	74	72	69	74	79	59	74	71	74	
39**	How much more would a person pay to buy a certain car on credit than by paying cash	57	60	55	59	60	62	56	61	63	39	60	62	58	56
40**	1½ pounds = __ ounces	74	81	69	78	74	91	76	78	77	51	74	79	80	
41**	Parking lot charges 35¢ first hour, 25¢ for each additional hour or fraction. what is the cost to park from 10:45 A.M. to 3:05 P.M.	54	58	52	59	59	56	54	55	57	40	55	58	57	47
42**	Degrees of third angle of a triangle	52	55	49	59	57	55	44	59	45	36	50	53	59	52
43**	Person left for work at 7:45 A.M., returned home 10 hours later at what time	87	89	84	88	89	89	89	87	91	74	89	89	88	82
44	Find volume of box	75	80	71	76	81	80	73	76	89	54	75	78	80	
45	425 x 0.33 =	88	85	90	90	89	89	83	90	91	77	90	90	89	
46	⅚ - ⅓ =	66	66	66	71	75	72	60	69	66	44	69	70	69	
47	1.96 ÷ 0.4 =	71	71	70	71	76	72	68	75	74	59	72	71	74	
48	Metric unit used to measure capacity of gasoline tank	86	92	81	88	91	88	86	89	94	68	88	89	89	
49	Number that is greatest (decimals)	93	95	91	96	96	96	92	94	94	79	95	96	94	93
50	Reading a line graph	93	94	92	95	96	95	93	94	95	82	94	95	96	
51	17 ÷ 0.25 =	60	62	58	60	59	66	62	65	60	44	60	63	63	
52	74 x 38 =	89	87	90	87	91	92	87	89	91	83	89	91	89	
53	Number that is smallest (decimals)	77	83	73	78	85	82	74	80	83	57	81	79	80	75
54	⅞ ÷ 2	66	66	66	70	69	69	62	70	74	49	67	68	69	
55	46 x 50 =	95	94	96	97	94	97	95	96	94	90	95	97	96	
56	2⅜ + 3⅞ =	76	78	76	79	80	81	78	78	80	58	79	80	80	
57	Smallest metric unit of measure	73	79	68	76	82	80	73	73	79	50	75	79	77	
58	At average speed of 50 MPH, how many hours to travel 275 miles	58	67	50	59	62	63	57	56	60	45	60	59	60	
59	Fraction that is greatest	45	61	34	44	54	52	46	43	49	27	50	48	48	49
60	Estimate circumference of circle given the diameter	32	42	25	34	35	35	31	32	34	23	32	34	35	
61	½ + ⅓ =	72	73	71	77	80	76	69	74	68	52	74	75	75	
62	13 boys and 15 girls in a group, what fractional part is boys	52	53	50	58	56	55	46	51	49	42	51	54	54	
63	3 ÷ ¾ =	58	58	58	62	58	64	58	59	59	47	64	61	57	
64	2 hours 20 minutes = __ minutes	94	95	93	95	95	96	96	94	97	83	96	96	95	

* Regions do not include "Big Cities."
** Open-ended item.

APPENDIX C

Copies of Student Questionnaire Instruments

FOURTH GRADE

Questions About You

1. Are you: 1 ○ a boy? 2 ○ a girl?

2. During which month were you born? (Fill in ONE circle.)

1 ○ January
2 ○ February
3 ○ March
4 ○ April
5 ○ May
6 ○ June
7 ○ July
8 ○ August
9 ○ September
10 ○ October
11 ○ November
12 ○ December

3. During which year were you born? (Fill in ONE circle.)

1 ○ 1965
2 ○ 1966
3 ○ 1967
4 ○ 1968
5 ○ 1969

4. How many people live in your house or apartment? Count yourself, brothers and sisters, parents, grandparents, and other people who live with you.

Write the number here: ________________

5. How many rooms are there in your house or apartment? Don't count bathrooms.

Write the number here: ________________

6. How often do you talk about your school work at home? (Fill in ONE circle.)

1 ○ never or hardly ever
2 ○ once or twice a month
3 ○ once or twice a week
4 ○ just about every day

7. Do your parents usually help you with your school work? (Fill in ONE circle.)

1 ○ yes 2 ○ no

8. Do you like your school? Think about it OVERALL, not just today or this week. (Fill in ONE circle.)

1 ○ I hate it.
2 ○ I don't like it very much.
3 ○ It's O.K.
4 ○ I like it pretty much.
5 ○ I like it a lot.

9. About how many hours each day do you watch TV? (Fill in ONE circle.)

1 ○ less than 1 hour
2 ○ between 1 and 2 hours
3 ○ between 2 and 3 hours
4 ○ between 3 and 4 hours
5 ○ more than 4 hours

10. How much do you like math? (Fill in ONE circle.)

1 ○ not at all
2 ○ somewhat
3 ○ very much

11. How useful do you feel math is compared to the other subjects you study? (Fill in ONE circle.)

- 1 ○ not very useful
- 2 ○ somewhat useful
- 3 ○ very useful

STOP

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EIGHTH GRADE

Questions About You

1. Are you: 1 ○ male? 2 ○ female?

2. During which month were you born?

   1 ○ January
   2 ○ February
   3 ○ March
   4 ○ April
   5 ○ May
   6 ○ June
   7 ○ July
   8 ○ August
   9 ○ September
   10 ○ October
   11 ○ November
   12 ○ December

3. During which year were you born?

   1 ○ 1961
   2 ○ 1962
   3 ○ 1963
   4 ○ 1964
   5 ○ 1965

4. How many people live in your house? Count yourself, brothers and sisters, parents, grandparents, and other people who live with you.

   Write the number here: ____________

5. How many rooms are there in your home? Don't count bathrooms.

   Write the number here: ____________

6. How often do you and the adults in your home talk about your school work and school experiences? (Fill in ONE circle.)

1 ○ never or hardly ever
2 ○ once or twice a month
3 ○ once or twice a week
4 ○ just about every day

7. How much encouragement do you feel your parents give you in your school work?

1 ○ hardly any at all
2 ○ only a little
3 ○ quite a bit
4 ○ a lot

8. How do you like your school? Think about it OVERALL, not just today or this week. (Fill in ONE circle.)

1 ○ I hate it.
2 ○ I don't like it very much.
3 ○ It's O.K.
4 ○ I like it pretty much.
5 ○ I like it a lot.

9. About how many hours each day do you watch TV? (Fill in ONE circle.)

1 ○ less than 1 hour
2 ○ between 1 and 2 hours
3 ○ between 2 and 3 hours
4 ○ between 3 and 4 hours
5 ○ more than 4 hours

10. How much do you like math?

1 ○ not at all
2 ○ somewhat
3 ○ very much

11. How useful do you feel math is compared to the other subjects you study? (Fill in ONE circle.)

1 ○ not very useful
2 ○ somewhat useful
3 ○ very useful

STOP

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ELEVENTH GRADE

Questions About You

1. Are you: 1 ○ male? 2 ○ female?

2. During which month were you born?

1 ○ January
2 ○ February
3 ○ March
4 ○ April
5 ○ May
6 ○ June
7 ○ July
8 ○ August
9 ○ September
10 ○ October
11 ○ November
12 ○ December

3. During which year were you born?

1 ○ 1958
2 ○ 1959
3 ○ 1960
4 ○ 1961
5 ○ 1962

4. How many people live in your house? Count yourself, brothers and sisters, parents, grandparents, and other people who live with you.

Write the number here: ______________

5. How many rooms are there in your home? Don't count bathrooms.

Write the number here: ______________

6. How much encouragement do you feel your parents give you in your school work? (Fill in ONE circle.)

1○ hardly any at all
2○ only a little
3○ quite a bit
4○ a lot

7. How do you like your school? Think about it OVERALL, not just today or this week. (Fill in ONE circle.)

1○ I hate it.
2○ I don't like it very much.
3○ It's O.K.
4○ I like it pretty much.
5○ I like it a lot.

8. All in all, what is the highest level of schooling which you would LIKE to attain in the future? (Fill in ONE circle.)

1○ not finish high school
2○ graduate from high school
3○ graduate from high school and then go to a vocational, technical, or business school
4○ go to a two-year, community, or junior college
5○ go to a four-year college or university
6○ go to a graduate or professional school after college

9. About how many hours each day do you watch TV? (Fill in ONE circle.)

1○ less than 1 hour
2○ between 1 and 2 hours
3○ between 2 and 3 hours
4○ between 3 and 4 hours
5○ more than 4 hours

10. How much do you like math? (Fill in ONE circle.)

- 1○ not at all
- 2○ somewhat
- 3○ very much

11. How useful do you feel math is compared to the other subjects you study? (Fill in ONE circle.)

- 1○ not very useful
- 2○ somewhat useful
- 3○ very useful

12. Do you find the math you study useful in your life outside of school? (Fill in ONE circle.)

- 1○ not very useful
- 2○ somewhat useful
- 3○ very useful

13. Considering grades 9, 10, and 11, how many years have you had math? (Fill in ONE circle.)

- 1○ none
- 2○ 1 year
- 3○ 2 years
- 4○ 3 years

STOP

DO NOT TURN THE PAGE UNTIL YOU ARE TOLD TO DO SO.

APPENDIX D

Copies of Principal Questionnaire Instruments

Connecticut Assessment of Educational Progress
Mathematics — 1976-77

SCHOOL PRINCIPAL QUESTIONNAIRE

Fourth Grade

Please provide the following information for your school.

1. Total student enrollment: ____________________

2. Fourth-grade enrollment: ____________________

3. What is the average size of math classes in your school? ________________

4. Do you have any consultants or specialists who work with teachers in math?

   ☐ yes ☐ no

5. Number of instructional teacher aides (in full-time equivalents). Include only aides who work directly with teachers in regular math classes:

   ____

6. Indicate the type of classroom organization which predominates in your school. (Check one box in each category.)

   a. Students are assigned:
      - ☐ within grade level
      - ☐ irrespective of grade level (includes multi-grade classrooms)

   b. Students are assigned:
      - ☐ according to achievement level (most classes are homogeneous)
      - ☐ irrespective of achievement level (most classes are heterogeneous)

7. How would you best describe your typical fourth-grade math classroom? (Check one.)

☐ traditional teacher-centered activities

☐ individualized instruction

8. Has any major curriculum or program development in mathematics taken place in your school during the last five years?

☐ yes ☐ no

9. According to your mathematics teachers, do any of the problems listed below exist in your school? (Check one box for each item.)

		yes	no
a.	Lack of funds for mathematics supplies	☐	☐
b.	Lack of audio-visual materials	☐	☐
c.	Lack of planning time for teachers	☐	☐
d.	Class sizes too large	☐	☐

10. In your school, how many hours are allocated to mathematics instruction per class per week?

____________ hours

Connecticut Assessment of Educational Progress
Mathematics — 1976-77

SCHOOL PRINCIPAL QUESTIONNAIRE

Eighth Grade

Please provide the following information for your school.

1. Total student enrollment: ________________

2. Eighth-grade enrollment: ________________

3. What is the average size of math classes in your school? ______________

4. Do you have any consultants or specialists who work with teachers in math?

☐ yes ☐ no

5. Number of instructional teacher aides (in full-time equivalents). Include only aides who work directly with teachers in regular math classes:

____

6. Indicate the type of classroom organization which predominates in your school. (Check one box in each category.)

a. Students are assigned:
☐ within grade level
☐ irrespective of grade level (includes multi-grade classrooms)

b. Students are assigned:
☐ according to achievement level (most classes are homogeneous)
☐ irrespective of achievement level (most classes are heterogeneous)

7. How would you best describe your typical eighth-grade math classroom? (Check one.)

☐ traditional teacher-centered activities
☐ individualized instruction

8. Has any major curriculum or program development in mathematics taken place in your school during the last five years?

☐ yes ☐ no

9. According to your mathematics teachers, do any of the problems listed below exist in your school? (Check one box for each item.)

		yes	no
a.	Lack of funds for mathematics supplies	☐	☐
b.	Lack of audio-visual materials	☐	☐
c.	Lack of planning time for teachers	☐	☐
d.	Class sizes too large	☐	☐

10. In your school, how many hours are allocated to mathematics instruction per class per week?

_____________ hours

Connecticut Assessment of Educational Progress
Mathematics — 1976-77

SCHOOL PRINCIPAL QUESTICNNAIRE

Eleventh Grade

Please provide the following information for your school.

1. Total student enrollment: ____________

2. Eleventh-grade enrollment: ____________

3. What is the average size of math classes in your school? ____________

4. Do you have any consultants or specialists who work with teachers in math?

   ☐ yes ☐ no

5. Number of instructional teacher aides (in full-time equivalents). Include only aides who work directly with teachers in regular math classes:

   ____

6. Indicate the type of classroom organization which predominates in your school. (Check one box in each category.)

   a. Students are assigned:
      - ☐ within grade level
      - ☐ irrespective of grade level (includes multi-grade classrooms)

   b. Students are assigned:
      - ☐ according to achievement level (most classes are homogeneous)
      - ☐ irrespective of achievement level (most classes are heterogeneous)

   c. Students are assigned:
      - ☐ according to curricular program (e.g., college, general)
      - ☐ irrespective of curricular program

7. Has any major curriculum or program development in mathematics taken place in your school during the last five years?

☐ yes ☐ no

8. According to your mathematics teachers, do any of the problems listed below exist in your school? (Check one box for each item.)

	yes	no
a. Lack of funds for mathematics supplies	☐	☐
b. Lack of audio-visual materials	☐	☐
c. Lack of planning time for teachers	☐	☐
d. Class sizes too large	☐	☐

9. In your school, how many hours are allocated to mathematics instruction per class per week?

____________ hours

APPENDIX E

Tables of Achievement Results by Reporting Groups on Total Test, Goals, and Objectives

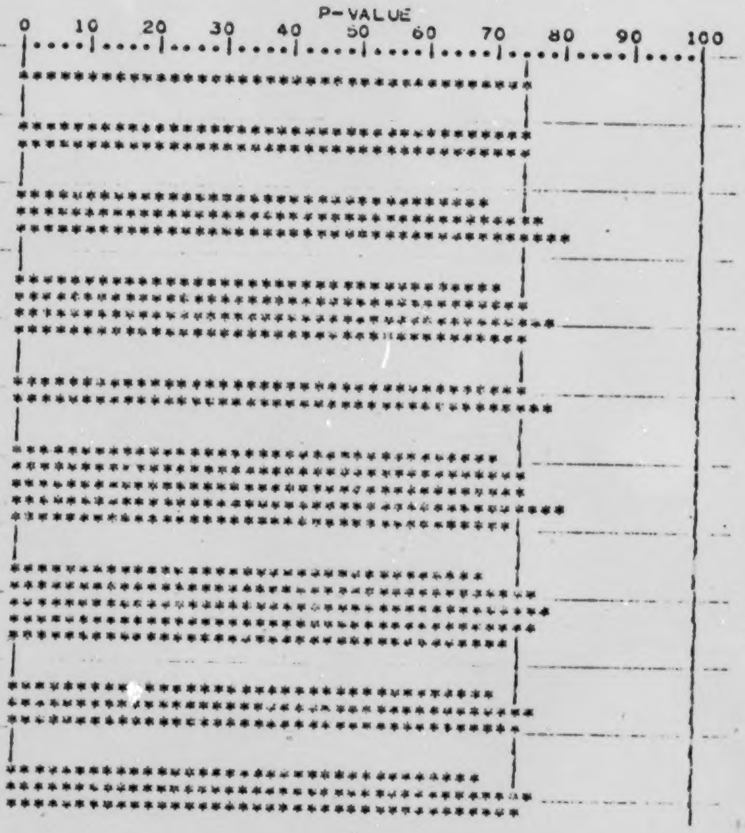
KEY FOR APPENDIX E

The analysis by reporting groups provides the following information for the total test, each goal area, and each objective. The P-VALUE is the estimated average percentage of test items answered correctly by students in the population or in the particular reporting group. SE OF P-VALUE is the standard error of measurement for the p-value. GROUP EFFECT is the difference between the state average (all students) and that for the reporting group. An asterisk (*) means that the group effect (the difference) is significant at the 95% confidence level. SE OF EFFECT is the standard error of measurement of the group effect. SAMPLE SIZE is the actual number of students in the reporting group who took the test.

NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
CONNECTICUT STATEWIDE ASSESSMENT - 4TH GRADE - FEBRUARY 1977

I TOTAL TEST SCORE

P-VALUE	SE OF P-VALUE	GROUP EFFECT	SE OF EFFECT	SAMPLE SIZE	REPORTING GROUP
74.33	0.63			2437	ALL STUDENTS
----SEX OF THE STUDENT ----					
74.75	0.75	0.43	0.34	1145	MALE
73.96	0.59	-0.37	0.21	12[illegible]	FEMALE
----SOCIO-ECONOMIC STATUS ----					
68.74	0.93	-5.59*	0.53	948	LOW
76.64	0.62	2.31*	0.41	823	MEDIUM
79.49	0.64	5.16*	0.59	656	HIGH
----YOU AND PARENTS TALK ABOUT SCHOOL ----					
69.12	1.13	-5.20*	0.85	303	HARDLY EVER
74.88	1.54	0.55	1.31	121	MONTHLY
78.11	0.69	3.78*	0.36	544	WEEKLY
74.03	0.71	-0.29	0.26	1461	DAILY
----PARENTS HELP WITH SCHOOL WORK ----					
73.28	0.66	-1.05*	0.23	1758	YES
77.25	0.90	2.92*	0.57	671	NO
----DO YOU LIKE YOUR SCHOOL? ----					
69.94	1.49	-4.39*	1.27	138	I HATE IT
74.30	1.37	-0.02	1.18	130	I DON'T LIKE IT
74.69	0.71	0.36	0.41	884	IT'S OK
79.26	0.71	4.93*	0.66	431	I LIKE IT
72.22	0.91	-2.11*	0.46	849	I LIKE IT A LOT
----HOW MANY HOURS PER DAY WATCHING TV? ----					
67.64	2.05	-6.68*	1.66	144	LESS THAN 1 HR
76.53	0.95	2.21*	0.79	346	BETWEEN 1+2 HRS
78.75	0.64	4.42*	0.56	451	BETWEEN 2+3 HRS
76.40	0.79	2.07*	0.65	478	BETWEEN 3+4 HRS
71.59	0.85	-2.73*	0.43	1013	MORE THAN 4 HRS
----HOW MUCH DO YOU LIKE MATH? ----					
69.50	1.25	-4.82*	1.02	230	NOT AT ALL
75.75	0.61	1.44*	0.45	944	SOMEWHAT
74.20	0.83	-0.13	0.36	1257	VERY MUCH
----MATH USEFUL COMPARED TO OTHER SUBJECTS ----					
67.08	1.74	-7.24*	1.50	118	NOT VERY USEFUL
75.98	0.69	1.66*	0.55	598	SOMEWHAT USEFUL
74.18	0.75	-0.15	0.27	1611	VERY USEFUL



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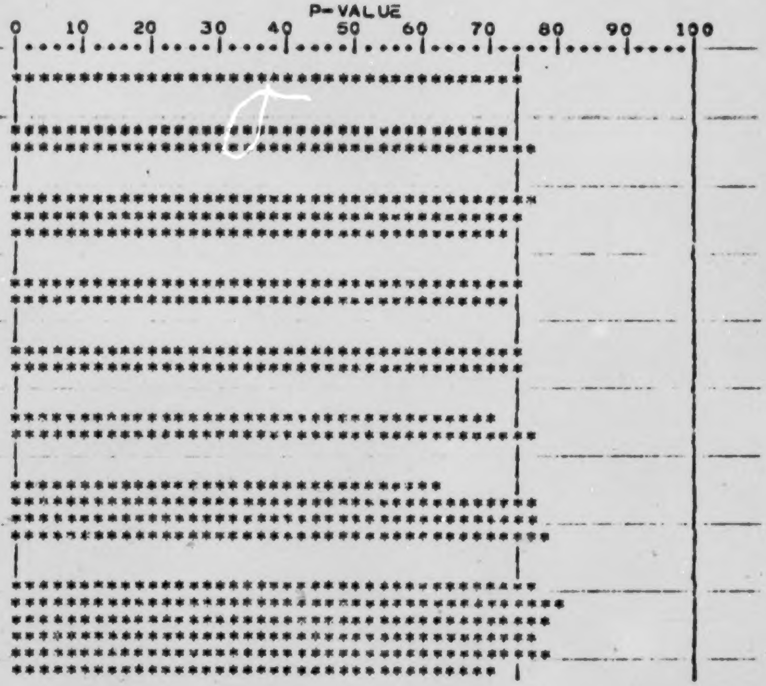
CONNECTICUT STATEWIDE ASSESSMENT - 4TH GRADE - FEBRUARY 1977

1 TOTAL TEST SCORE

P-VALUE	SE OF P-VALUE	GROUP EFFECT	SE OF EFFECT	SAMPLE SIZE	REPORTING GROUP
74.33	0.63			2437	ALL STUDENTS
----CONSULTANTS OR SPECIALISTS ----					
71.26	1.48	-3.07*	1.18	811	YES
75.79	0.70	1.46*	0.54	1625	NO
----STUDENTS ASSIGNED BY ACHIEVEMENT LEVEL ----					
75.72	1.25	1.39	1.07	665	YES
74.02	0.83	-0.31	0.52	1590	NO
71.43	3.06	-2.90	3.59	110	BOTH
----TYPICAL MATH CLASSROOM ----					
74.98	0.78	0.65	0.63	1431	TEACHER CENTERED
71.63	1.56	-2.70*	1.24	753	INDIVIDUALIZED
----CURRICULUM OR PROGRAM DEVELOPMENT ----					
74.75	0.84	0.41	0.41	1665	YES
73.41	1.01	-0.91	0.95	748	NO
----CLASS SIZE TOO LARGE ----					
69.01	1.65	-5.31*	1.38	684	YES
76.16	0.66	1.84*	0.53	1718	NO
----SIZE OF COMMUNITY ----					
62.11	1.82	-12.22*	1.56	478	BIG CITIES
76.90	0.75	2.57*	0.83	647	FRINGE CITIES
75.19	1.17	0.86	1.02	638	MEDIUM CITIES
78.31	0.89	3.98*	0.79	674	SMALLER PLACES
----REGION OF THE STATE ----					
76.03	1.18	1.70	1.19	319	RESCUE
79.39	1.24	5.06*	1.22	353	COOP ED SERVICES
77.17	1.07	2.84*	1.01	562	CREC
75.51	0.95	1.18	1.00	372	ACES
78.31	1.39	3.98*	1.35	281	PROJECT LEARN
70.49	3.54	-3.84	3.45	72	NARSES



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                   CONNECTICUT STATEWIDE ASSESSMENT - 4TH GRADE - FEBRUARY 1976

             GOAL  1  MATHEMATICAL CONCEPTS
                                                                                         P-VALUE
         SE OF     GROUP     SE OF  SAMPLE                        0    10   20   30   40   50   60   70   80   90   100
P-VALUE P-VALUE   EFFECT    EFFECT    SIZE    REPORTING GROUP     |....|....|....|....|....|....|....|....|....|....|
 74.42    0.81                        2437    ALL STUDENTS        *************************************

----SEX OF THE STUDENT                                 ----
 74.81    0.98      0.39    0.46      1146    MALE                *************************************
 74.08    0.89     -0.35    0.41      1290    FEMALE              *************************************

----SIZE OF THE COMMUNITY                              ----
 59.73    2.06   -14.69*    1.81       478    BIG CITIES          ******************************
 78.05    1.09      3.62*   1.13       647    FRINGE CITIES       ***************************************
 75.42    1.45      1.00    1.23       638    MEDIUM CITIES       **************************************
 78.87    1.32      4.45*   1.08       674    SMALLER PLACES      ***************************************

----REGION OF THE STATE                                ----
 76.34    1.66      1.92    1.53       319    RESCUE              **************************************
 80.35    1.64      5.93*   1.59       353    COOP ED SERVICE     ****************************************
 78.38    1.35      3.95*   1.26       562    CREC                ***************************************
 76.28    1.55      1.86    1.51       372    ACES                **************************************
 77.67    2.37      3.25    2.20       281    PROJECT LEARN       ***************************************
 71.10    4.65     -3.33    4.54        72    NARSES              ************************************
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                 NATIONAL EVALUATION SYSTEMS. INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
                   CONNECTICUT STATEWIDE ASSESSMENT - 4TH GRADE - FEBRUARY 1976

             GOAL  2  COMPUTATION
                                                                                         P-VALUE
         SE OF     GROUP     SE OF  SAMPLE                        0    10   20   30   40   50   60   70   80   90   100
P-VALUE P-VALUE   EFFECT    EFFECT    SIZE    REPORTING GROUP     |....|....|....|....|....|....|....|....|....|....|
 78.61    0.77                        2437    ALL STUDENTS        ***************************************

----SEX OF THE STUDENT                                 ----
 76.67    0.98     -1.94*   0.43      1146    MALE                **************************************
 80.35    0.79      1.74*   0.38      1290    FEMALE              ****************************************

----SIZE OF THE COMMUNITY                              ----
 68.61    2.24    -10.00*   1.93       478    BIG CITIES          **********************************
 81.37    0.95      2.76*   1.03       647    FRINGE CITIES       *****************************************
 78.52    1.67     -0.09    1.39       638    MEDIUM CITIES       ***************************************
 82.03    1.13      3.42*   0.99       674    SMALLER PLACES      *****************************************

----REGION OF THE STATE                                ----
 79.87    1.75      1.26    1.69       319    RESCUE              ****************************************
 83.30    1.84      4.69*   1.73       353    COOP ED SERVICE     ******************************************
 79.90    1.34      1.29    1.25       562    CREC                ****************************************
 80.71    1.53      2.10    1.48       372    ACES                ****************************************
 83.18    1.64      4.57*   1.60       281    PROJECT LEARN       ******************************************
 71.35    3.88     -7.26    3.80        72    NARSES              ************************************
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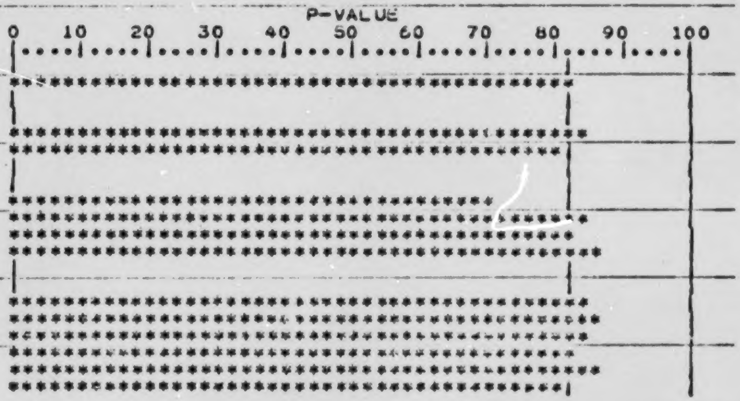
NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
CONNECTICUT STATEWIDE ASSESSMENT - 4TH GRADE - FEBRUARY 1976

GOAL 3 MEASUREMENT

P-VALUE	SE OF P-VALUE	GROUP EFFECT	SE OF EFFECT	SAMPLE SIZE	REPORTING GROUP
81.70	0.57			2437	ALL STUDENTS
----SEX OF THE STUDENT					----
83.51	0.66	1.81*	0.33	1146	MALE
80.10	0.66	-1.61*	0.30	1290	FEMALE
----SIZE OF THE COMMUNITY					----
69.92	1.75	-11.78*	1.48	478	BIG CITIES
83.53	0.77	1.83*	0.79	647	FRINGE CITIES
82.76	0.97	1.26	0.87	638	MEDIUM CITIES
85.66	0.69	3.95*	0.68	674	SMALLER PLACES
----REGION OF THE STATE					----
83.49	1.02	1.79	1.04	319	RESCUE
85.82	0.88	4.12*	0.93	353	COOP ED SERVICE
84.62	0.99	2.92*	0.91	552	CREC
82.30	0.87	0.60	0.91	372	ACES
85.79	1.07	4.09*	1.08	281	PROJECT LEARN
80.62	3.10	-1.08	3.03	72	NARSES



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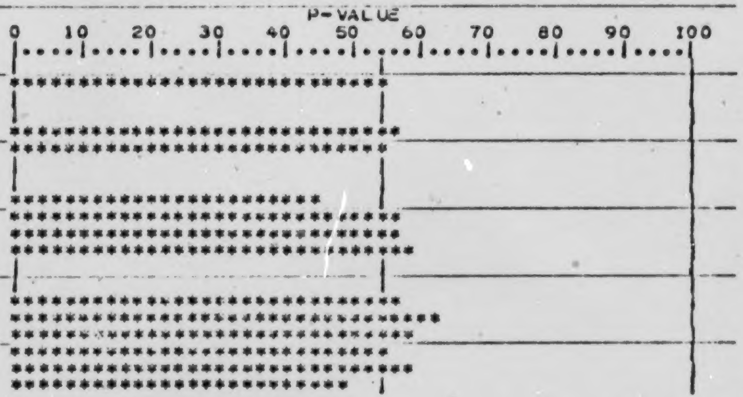
CONNECTICUT STATEWIDE ASSESSMENT - 4TH GRADE - FEBRUARY 1976

GOAL 4 PROBLEM SOLVING

P-VALUE	SE OF P-VALUE	GROUP EFFECT	SE OF EFFECT	SAMPLE SIZE	REPORTING GROUP
54.56	0.69			2437	ALL STUDENTS
----SEX OF THE STUDENT					----
56.02	0.83	1.46*	0.42	1146	MALE
53.30	0.60	-1.27*	0.39	1290	FEMALE
----SIZE OF THE COMMUNITY					----
43.03	1.88	-11.53*	1.63	478	BIG CITIES
56.90	0.93	2.34*	0.96	647	FRINGE CITIES
55.54	1.21	0.98	1.08	638	MEDIUM CITIES
58.25	1.14	3.69*	0.93	674	SMALLER PLACES
----REGION OF THE STATE					----
56.01	1.36	1.45	1.35	319	RESCUE
61.20	1.26	6.64*	1.25	353	COOP ED SERVICE
57.37	1.11	2.81*	1.06	562	CREC
54.72	1.22	0.16	1.20	372	ACES
58.11	1.70	3.55*	1.61	281	PROJECT LEARN
48.06	3.97	-6.51	3.67	72	NARSES



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               CONNECTICUT STATEWIDE ASSESSMENT - 4TH GRADE - FEBRUARY 1976

                  GOAL  5  CHARTS AND GRAPHS

            SE OF     GROUP     SE OF   SAMPLE
P-VALUE   P-VALUE    EFFECT    EFFECT    SIZE              REPORTING GROUP

 78.37      0.63                         2437              ALL STUDENTS

----SEX OF THE STUDENT                           ----
 79.83      0.71      1.45*     0.37     1146              MALE
 77.07      0.75     -1.30*     0.33     1290              FEMALE

----SIZE OF THE COMMUNITY                        ----
 64.48      1.63    -13.90*     1.42      478              BIG CITIES
 80.04      0.83      1.67      0.86      647              FRINGE CITIES
 80.01      1.14      1.64      1.00      638              MEDIUM CITIES
 83.23      0.83      4.86*     0.76      674              SMALLER PLACES

----REGION OF THE STATE                          ----
 81.06      1.33      2.69*     1.30      319              RESCUE
 81.26      1.36      2.89*     1.32      353              COOP ED SERVICE
 82.28      1.10      3.91*     1.01      552              CREC
 78.71      1.03      0.34      1.08      372              ACES
 83.36      0.95      4.98*     1.03      281              PROJECT LEARN
 80.28      3.92      1.90      3.81       72              NARSES
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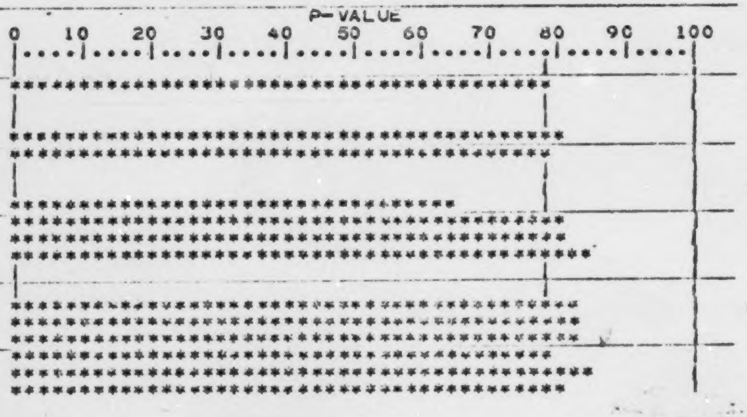

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                 NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
                     CONNECTICUT STATEWIDE ASSESSMENT - 4TH GRADE - FEBRUARY 1976

--------------- OBJECTIVE  1  STUDENT DEMONSTRATES UNDERSTANDING OF PLACE VALUE FOR WHOLE NUMBERS
                                                                                                   P-VALUE
            SE OF     GROUP      SE OF    SAMPLE                                 0    10   20   30   40   50   60   70   80   90   100
P-VALUE   P-VALUE    EFFECT     EFFECT     SIZE       REPORTING GROUP           |....|....|....|....|....|....|....|....|....|....|
-------------------------------------------------------------------------------------------------------------------------------------
  79.26     0.85                           2437       ALL STUDENTS              ****************************************|         |
                                                                                |                                       |         |
----SEX OF THE STUDENT                            ----                          |                                       |         |
  80.29     1.02       1.03       0.55     1146       MALE                      ****************************************         |
  78.33     1.00      -0.93       0.50     1290       FEMALE                    ***************************************|          |
                                                                                |                                       |         |
----SIZE OF THE COMMUNITY                         ----                          |                                       |         |
  61.97     2.56     -17.29*      2.18      478       BIG CITIES                *******************************         |         |
  83.13     0.92       3.88*      1.07      647       FRINGE CITIES             ******************************************        |
  81.20     1.68       1.95       1.43      638       MEDIUM CITIES             *****************************************         |
  84.15     1.01       4.90*      1.00      674       SMALLER PLACES            ******************************************        |
-------------------------------------------------------------------------------------------------------------------------------------
----REGION OF THE STATE                           ----                          |                                       |         |
  82.58     1.59       3.32*      1.59      319       RESCUE                    *****************************************         |
  83.08     1.58       3.82*      1.87      353       COOP ED SERVICE           ******************************************        |
  84.65     1.43       5.39*      1.37      562       CREC                      ******************************************        |
  81.12     1.16       1.86       1.24      372       ACES                      *****************************************         |
  83.06     1.83       3.80*      1.78      281       PROJECT LEARN             ******************************************        |
  80.00     3.27       0.74       3.25       72       NARSES                    ****************************************          |
-------------------------------------------------------------------------------------------------------------------------------------


                 NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
                     CONNECTICUT STATEWIDE ASSESSMENT - 4TH GRADE - FEBRUARY 1976

--------------- OBJECTIVE  2  STUDENT DEMONSTRATES UNDERSTANDING OF ORDERING OF WHOLE NUMBERS
                                                                                                   P-VALUE
            SE OF     GROUP      SE OF    SAMPLE                                 0    10   20   30   40   50   60   70   80   90   100
P-VALUE   P-VALUE    EFFECT     EFFECT     SIZE       REPORTING GROUP           |....|....|....|....|....|....|....|....|....|....|
-------------------------------------------------------------------------------------------------------------------------------------
  77.72     0.67                           2437       ALL STUDENTS              ***************************************|          |
                                                                                |                                      |          |
----SEX OF THE STUDENT                            ----                          |                                      |          |
  79.10     0.86       1.37*      0.46     1146       MALE                      ****************************************          |
  76.49     0.77      -1.23*      0.42     1290       FEMALE                    **************************************|           |
                                                                                |                                      |          |
----SIZE OF THE COMMUNITY                         ----                          |                                      |          |
  64.99     1.62     -12.74*      1.44      478       BIG CITIES                ********************************       |          |
  81.15     0.72       3.43*      0.83      647       FRINGE CITIES             *****************************************         |
  79.10     1.19       1.38       1.05      638       MEDIUM CITIES             ****************************************          |
  81.01     1.14       3.28*      0.91      674       SMALLER PLACES            *****************************************         |
-------------------------------------------------------------------------------------------------------------------------------------
----REGION OF THE STATE                           ----                          |                                      |          |
  81.74     1.91       4.02*      1.73      319       RESCUE                    *****************************************         |
  81.84     1.34       4.16*      1.30      353       COOP ED SERVICE           *****************************************         |
  80.56     1.21       2.84*      1.09      562       CREC                      ****************************************          |
  79.86     0.72       2.14*      0.88      372       ACES                      ****************************************          |
  79.65     1.55       1.92       1.48      281       PROJECT LEARN             ****************************************          |
  74.72     3.20      -3.00       3.14       72       NARSES                    *************************************  |          
                    NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
                       CONNECTICUT STATEWIDE ASSESSMENT - 6TH GRADE - FEBRUARY 1976

              OBJECTIVE  3  STUDENT DEMONSTRATES UNDERSTANDING OF FRACTIONAL NOTATION

            SE OF     GROUP      SE OF    SAMPLE
P-VALUE    P-VALUE    EFFECT     EFFECT    SIZE                REPORTING GROUP

 66.38      1.52                           2437                ALL STUDENTS

----SEX OF THE STUDENT                                 ----
 65.14      1.77      -1.24      0.69      1146                MALE
 67.48      1.58       1.11      0.61      1290                FEMALE

----SIZE OF THE COMMUNITY                              ----
 52.22      2.99     -14.16*     3.81       478                BIG CITIES
 69.93      2.62       3.55      2.44       647                FRINGE CITIES
 66.06      2.86      -0.32      2.49       638                MEDIUM CITIES
 71.57      2.57       5.20*     2.24       674                SMALLER PLACES

----REGION OF THE STATE                                ----
 64.81      4.22      -1.56      3.87       319                RESCUE
 76.29      3.26       9.91*     3.12       353                COOP ED SERVICE
 70.00      2.65       3.62      2.43       562                CREC
 67.92      4.13       1.54      3.77       372                ACES
 70.32      4.81       3.95      4.41       281                PROJECT LEARN
 58.89      9.11      -7.49      8.87        72                NARSES
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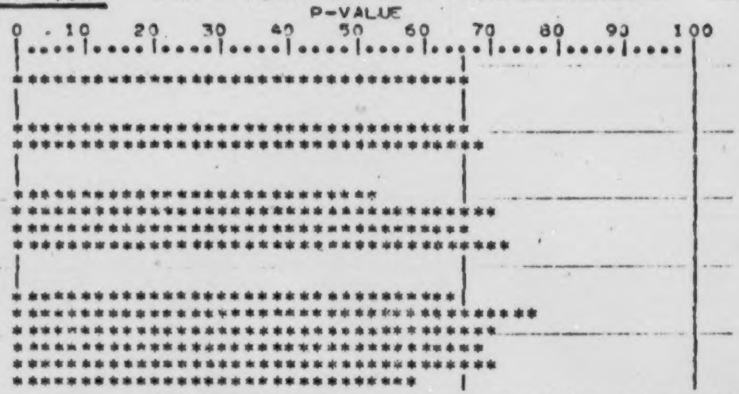

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                    NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
                       CONNECTICUT STATEWIDE ASSESSMENT - 6TH GRADE - FEBRUARY 1976

              OBJECTIVE  4  STUDENT DEMONSTRATES ABILITY TO ADD WHOLE NUMBERS

            SE OF     GROUP      SE OF    SAMPLE
P-VALUE    P-VALUE    EFFECT     EFFECT    SIZE                REPORTING GROUP

 81.50      0.65                           2437                ALL STUDENTS

----SEX OF THE STUDENT                                 ----
 80.04      0.92      -1.46*     0.42      1146                MALE
 82.81      0.62       1.30*     0.37      1290                FEMALE

----SIZE OF THE COMMUNITY                              ----
 72.01      1.90      -9.49*     1.64       478                BIG CITIES
 82.92      0.88       1.41      0.91       647                FRINGE CITIES
 83.08      1.16       1.58      1.03       638                MEDIUM CITIES
 84.30      1.09       2.80*     0.88       674                SMALLER PLACES

----REGION OF THE STATE                                ----
 80.78      1.32      -0.72      1.30       319                RESCUE
 85.50      1.23       4.00*     1.21       353                COOP ED SERVICE
 83.73      1.06       2.23*     1.00       562                CREC
 83.81      1.30       2.30      1.26       372                ACES
 85.51      1.36       4.00*     1.32       281                PROJECT LEARN
 76.94      5.40      -4.56      5.22        72 .              NARSES
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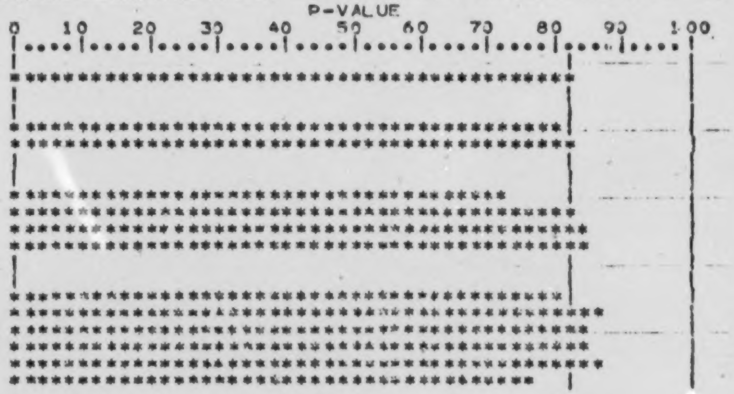
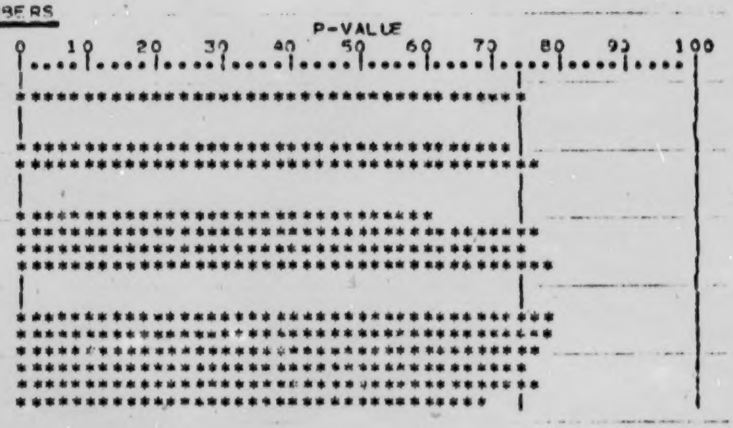


NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
CONNECTICUT STATEWIDE ASSESSMENT - 4TH GRADE - FEBRUARY 1976

OBJECTIVE 5 STUDENT DEMONSTRATES ABILITY TO SUBTRACT WHOLE NUMBERS

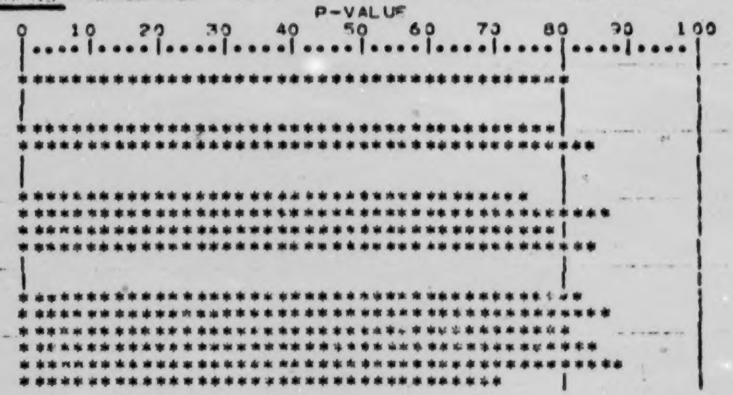
P-VALUE	SE OF P-VALUE	GROUP EFFECT	SE OF EFFECT	SAMPLE SIZE	REPORTING GROUP
73.46	0.90			2437	ALL STUDENTS
----SEX OF THE STUDENT ----					
71.45	1.15	-2.01*	0.62	1146	MALE
75.26	1.02	1.80*	0.54	1290	FEMALE
----SIZE OF THE COMMUNITY ----					
60.75	2.68	-12.71*	2.29	478	BIG CITIES
76.24	1.10	2.77*	1.19	647	FRINGE CITIES
73.83	1.90	0.37	1.59	638	MEDIUM CITIES
77.92	1.27	4.45*	1.13	674	SMALLER PLACES
----REGION OF THE STATE ----					
77.64	1.64	4.19*	1.66	319	RESCUE
78.81	2.45	5.35*	2.26	353	COOP ED SERVICE
76.09	1.18	2.62*	1.24	562	CREC
74.74	2.11	1.27	1.98	372	ACES
75.91	2.54	2.44	2.36	281	PROJECT LEARN
68.06	2.83	-5.41	2.86	72	NARSES



NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
CONNECTICUT STATEWIDE ASSESSMENT - 4TH GRADE - FEBRUARY 1976

OBJECTIVE 6 STUDENT DEMONSTRATES ABILITY TO MULTIPLY WHOLE NUMBERS

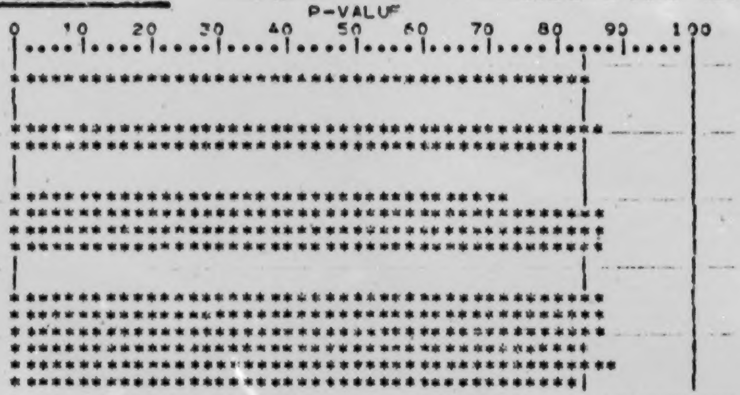
P-VALUE	SE OF P-VALUE	GROUP EFFECT	SE OF EFFECT	SAMPLE SIZE	REPORTING GROUP
80.95	1.08			2437	ALL STUDENTS
----SEX OF THE STUDENT ----					
78.61	1.31	-2.34*	0.55	1146	MALE
83.04	1.12	2.09*	0.48	1290	FEMALE
----SIZE OF THE COMMUNITY ----					
73.10	2.67	-7.85*	2.38	478	BIG CITIES
85.05	1.45	4.10*	1.50	647	FRINGE CITIES
78.72	2.76	-2.23	2.20	638	MEDIUM CITIES
83.97	1.59	3.02*	1.39	674	SMALLER PLACES
----REGION OF THE STATE ----					
81.28	3.27	0.33	2.99	319	RESCUE
85.72	2.40	4.76*	2.30	353	COOP ED SERVICE
79.95	2.77	-1.01	2.04	562	CREC
83.71	1.95	2.76	1.93	372	ACES
88.16	1.79	7.21*	1.87	281	PROJECT LEARN
69.17	5.52	-11.79*	5.40	72	NARSES



NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
CONNECTICUT STATEWIDE ASSESSMENT - 4TH GRADE - FEBRUARY 1976

OBJECTIVE 7 STUDENT DEMONSTRATES ABILITY TO CONVERT U.S. UNITS OF CURRENCY

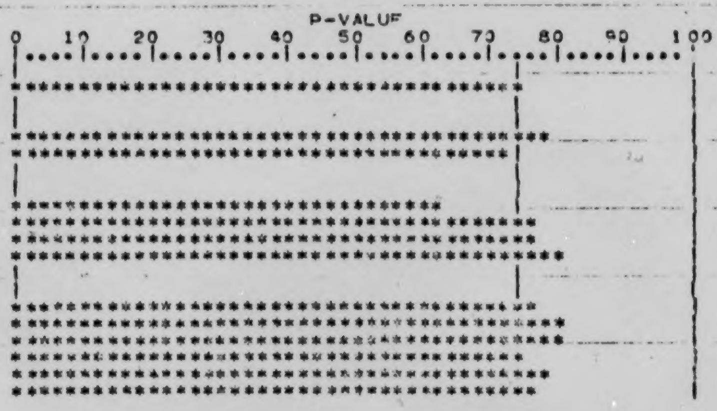
P-VALUE	SE OF P-VALUE	GROUP EFFECT	SE OF EFFECT	SAMPLE SIZE	REPORTING GROUP
83.35	0.65			2437	ALL STUDENTS
----SEX OF THE STUDENT					----
85.19	0.77	1.84*	0.47	1146	MALE
81.72	0.83	-1.63*	0.4[illegible]	1290	FEMALE
----SIZE OF THE COMMUNITY					----
71.05	1.95	-12.31*	1.67	478	BIG CITIES
85.27	0.87	1.91*	0.90	647	FRINGE CITIES
85.63	1.22	2.17*	1.05	638	MEDIUM CITIES
86.82	0.85	3.47*	0.80	674	SMALLER PLACES
----REGION OF THE STATE					----
85.27	1.14	1.91	1.15	319	RESCUE
86.88	1.19	3.52*	1.19	353	COOP ED SERVICE
86.88	1.25	3.52*	1.11	562	CREC
83.60	0.95	0.24	1.01	372	ACES
88.04	1.30	4.69*	1.29	281	PROJECT LEARN
81.94	3.65	-1.41	3.56	72	NARSES



NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
CONNECTICUT STATEWIDE ASSESSMENT - 4TH GRADE - FEBRUARY 1976

OBJECTIVE 8 STUDENT DEMONSTRATES ABILITY TO COMPUTE TIME

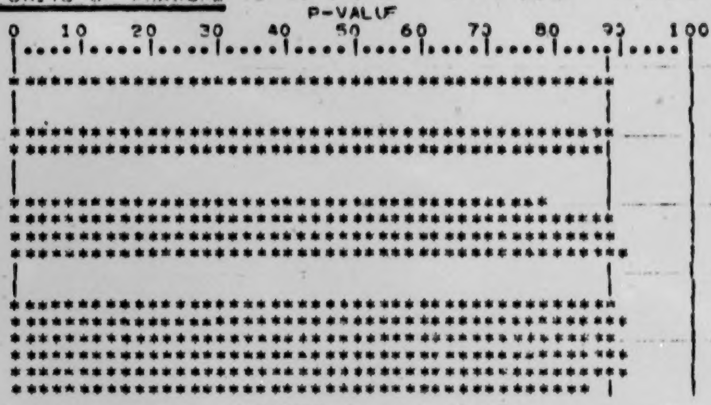
P-VALUE	SE OF P-VALUE	GROUP EFFECT	SE OF EFFECT	SAMPLE SIZE	REPORTING GROUP
74.83	0.77			2437	ALL STUDENTS
----SEX OF THE STUDENT					----
77.19	0.90	2.36*	0.50	1146	MALE
72.73	0.95	-2.10*	0.46	1290	FEMALE
----SIZE OF THE COMMUNITY					----
61.05	2.32	-13.78*	1.98	478	BIG CITIES
76.52	1.23	1.69	1.18	647	FRINGE CITIES
75.75	1.30	0.92	1.18	638	MEDIUM CITIES
80.15	1.07	5.32*	0.97	674	SMALLER PLACES
----REGION OF THE STATE					----
76.54	1.67	1.71	1.64	319	RESCUE
80.45	1.39	5.63*	1.41	353	COOP ED SERVICE
79.11	1.36	4.29*	1.26	562	CREC
73.89	1.49	-0.94	1.47	372	ACES
78.71	1.65	3.89*	1.62	281	PROJECT LEARN
75.83	4.36	1.01	4.25	72	NARSES



NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
CONNECTICUT STATEWIDE ASSESSMENT - 4TH GRADE - FEBRUARY 1976

OBJECTIVE 9 STUDENT DEMONSTRATES A WORKING KNOWLEDGE OF LINEAR UNITS OF MEASURE

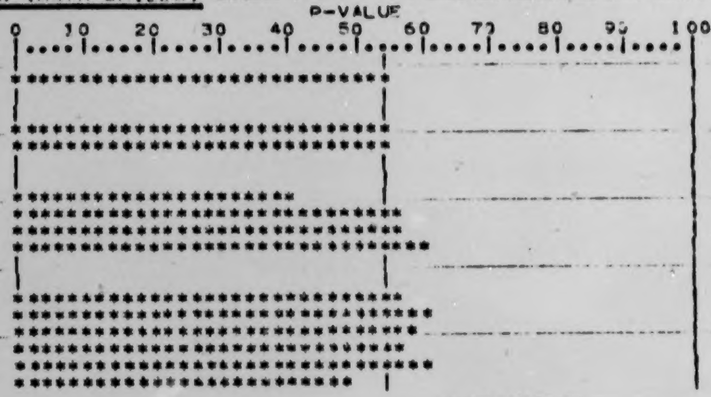
P-VALUE	SE OF P-VALUE	GROUP EFFECT	SE OF EFFECT	SAMPLE SIZE	REPORTING GROUP
87.00	0.52			2437	ALL STUDENTS
----SEX OF THE STUDENT					----
88.24	0.64	1.24*	0.33	1146	MALE
85.90	0.58	-1.10*	0.30	1290	FEMALE
----SIZE OF THE COMMUNITY					----
77.66	1.46	-9.35*	1.25	478	BIG CITIES
88.88	0.70	1.88*	0.72	647	FRINGE CITIES
87.69	1.02	0.69	0.87	638	MEDIUM CITIES
90.09	0.70	3.08*	0.64	674	SMALLER PLACES
----REGION OF THE STATE					----
88.72	0.99	1.71	0.99	319	RESCUE
90.22	1.05	3.21*	1.02	353	COOP ED SERVICE
87.98	1.03	0.97	0.91	562	CREC
89.49	0.64	2.48*	0.72	372	ACES
90.69	1.06	3.69*	1.03	281	PROJECT LEARN
84.17	2.78	-2.84	2.72	72	NARSES



NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
CONNECTICUT STATEWIDE ASSESSMENT - 4TH GRADE - FEBRUARY 1976

OBJECTIVE 10 STUDENT DEMONSTRATES ABILITY TO SOLVE WORD PROBLEMS (MATH SKILLS)

P-VALUE	SE OF P-VALUE	GROUP EFFECT	SE OF EFFECT	SAMPLE SIZE	REPORTING GROUP
54.40	0.86			2437	ALL STUDENTS
----SEX OF THE STUDENT					----
54.95	1.03	0.55	0.60	1146	MALE
53.96	1.07	-0.44	0.54	1290	FEMALE
----SIZE OF THE COMMUNITY					----
39.29	2.31	-15.11*	2.01	478	BIG CITIES
56.85	1.18	2.45*	1.21	647	FRINGE CITIES
55.62	1.63	1.21	1.41	638	MEDIUM CITIES
59.68	1.33	5.27*	1.12	674	SMALLER PLACES
----REGION OF THE STATE					----
55.69	1.91	1.29	1.85	319	RESCUE
60.81	1.74	6.41*	1.68	353	COOP ED SERVICE
58.08	1.53	3.68*	1.41	562	CREC
55.86	1.67	1.45	1.61	372	ACES
59.97	1.96	5.57*	1.88	281	PROJECT LEARN
48.61	4.18	-5.79	4.10	72	NARSES



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              NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
               CONNECTICUT STATEWIDE ASSESSMENT - 4TH GRADE - FEBRUARY 1976

         OBJECTIVE 11  STUDENT DEMONSTRATES ABILITY TO SOLVE WORD PROBLEMS (REAL WORLD)

             SE OF     GROUP     SE OF    SAMPLE
P-VALUE    P-VALUE    EFFECT    EFFECT     SIZE             REPORTING GROUP

 54.73       0.64                          2437             ALL STUDENTS

----SEX OF THE STUDENT                              ----
 57.10       0.93      2.37*      0.39     1146             MALE
 52.64       0.67     -2.09*      0.35     1290             FEMALE

----SIZE OF THE COMMUNITY                           ----
 46.78       1.63     -7.95*      1.43      478             BIG CITIES
 56.95       0.99      2.22*      0.90      647             FRINGE CITIES
 55.46       1.01      0.73       0.93      638             MEDIUM CITIES
 56.83       1.24      2.10*      0.93      674             SMALLER PLACES

----REGION OF THE STATE                             ----
 56.33       1.19      1.60       1.17      319             RESCUE
 61.59       1.17      6.86*      1.14      253             COOP ED SERVICE
 56.67       1.03      1.94*      0.97      562             CREC
 53.59       1.17     -1.14       1.14      372             ACES
 56.25       1.76      1.52       1.63      281             PROJECT LEARN
 47.50       3.83     -7.23       3.73       72             NARSES
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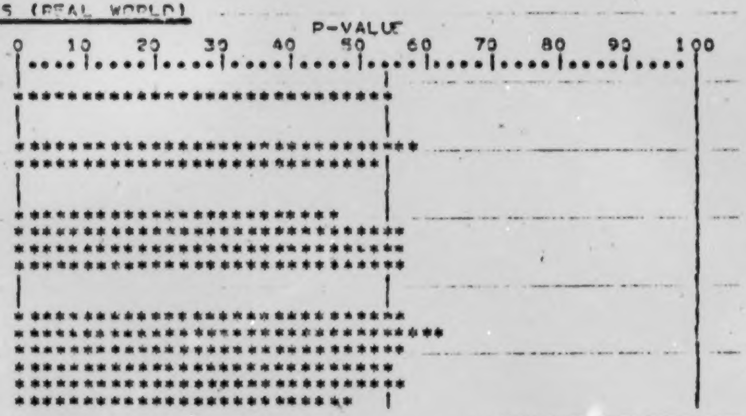

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              NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
               CONNECTICUT STATEWIDE ASSESSMENT - 4TH GRADE - FEBRUARY 1976

         OBJECTIVE 12  STUDENT DEMONSTRATES ABILITY TO INTERPRET CHARTS AND GRAPHS

             SE OF     GROUP     SE OF    SAMPLE
P-VALUE    P-VALUE    EFFECT    EFFECT     SIZE             REPORTING GROUP

 78.37       0.63                          2437             ALL STUDENTS

----SEX OF THE STUDENT                              ----
 79.83       0.71      1.45*      0.37     1146             MALE
 77.07       0.75     -1.30*      0.33     1290             FEMALE

----SIZE OF THE COMMUNITY                           ----
 64.49       1.63    -13.93*      1.42      478             BIG CITIES
 80.04       0.83      1.67       0.86      647             FRINGE CITIES
 80.01       1.14      1.64       1.00      638             MEDIUM CITIES
 83.27       0.83      4.95*      0.76      674             SMALLER PLACES

----REGION OF THE STATE                             ----
 81.06       1.37      2.63*      1.30      319             RESCUE
 81.26       1.36      2.83*      1.32      353             COOP ED SERVICE
 82.28       1.10      3.91*      1.01      562             CREC
 78.71       1.08      0.34       1.08      372             ACES
 83.36       0.96      4.98*      1.03      281             PROJECT LEARN
 80.28       3.92      1.90       3.81       72             NARSES
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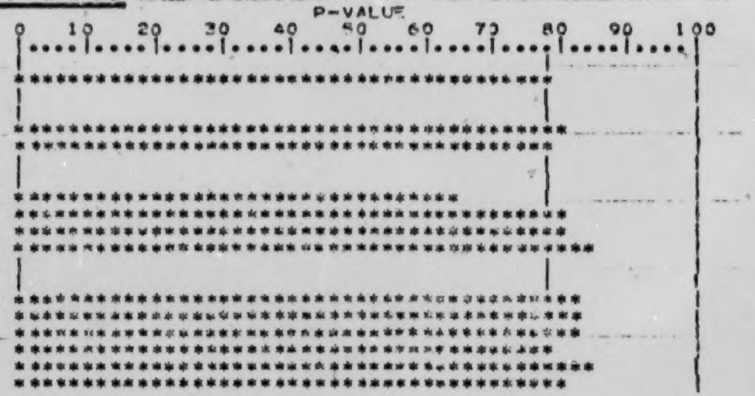
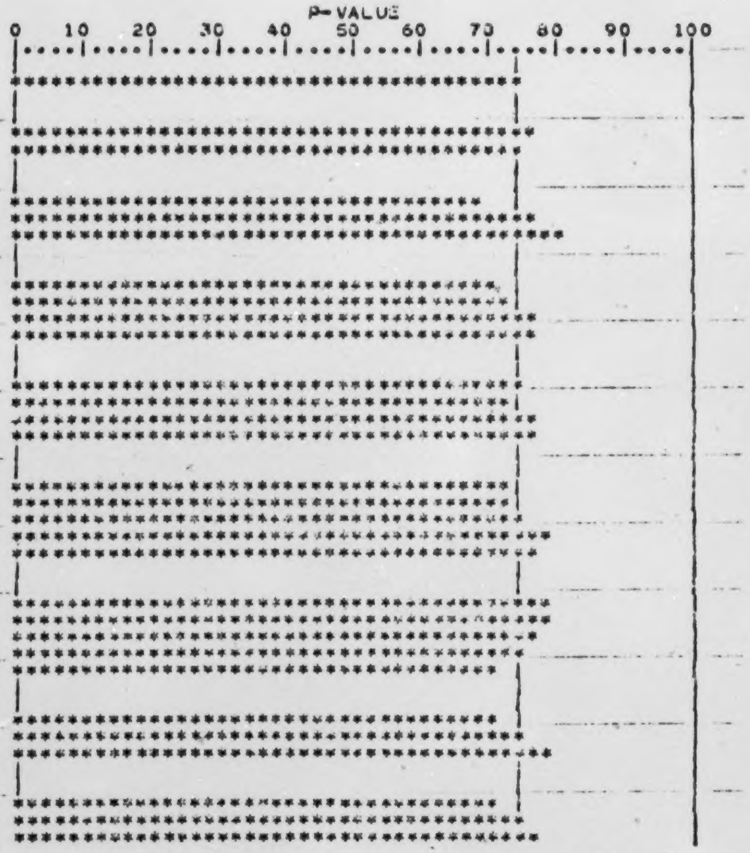


NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
CONNECTICUT STATEWIDE ASSESSMENT - 8TH GRADE - NOVEMBER 1976

1 TOTAL TEST SCORE

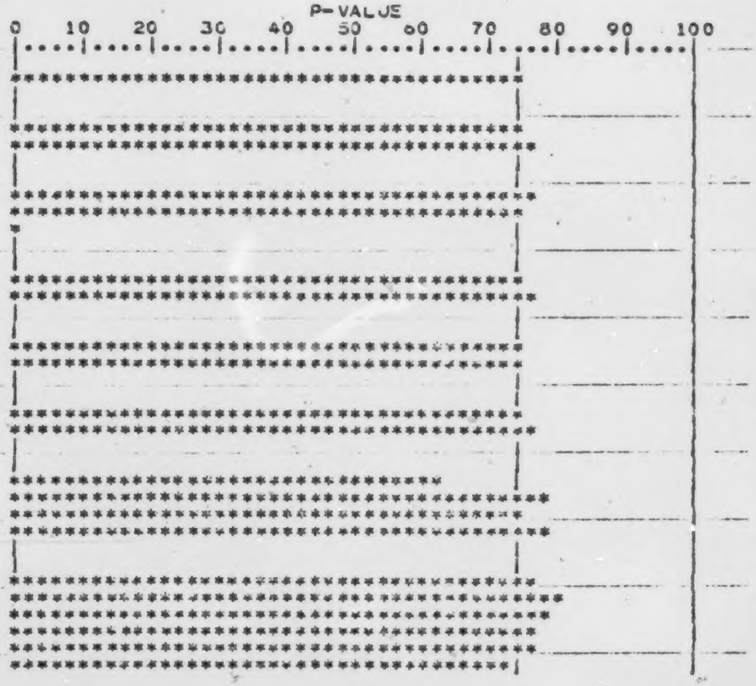
P-VALUE	SE OF P-VALUE	GROUP EFFECT	SE OF EFFECT	SAMPLE SIZE	REPORTING GROUP
74.78	0.49			2745	ALL STUDENTS
----SEX OF THE STUDENT ----					
76.72	0.57	1.94*	0.27	1255	MALE
73.14	0.57	-1.65*	0.23	1490	FEMALE
----SOCIO-ECONOMIC STATUS ----					
68.75	0.70	-6.04*	0.47	994	LOW
76.18	0.60	1.39*	0.35	937	MEDIUM
79.64	0.58	4.86*	0.44	809	HIGH
----YOU AND PARENTS TALK ABOUT SCHOOL ----					
70.01	1.36	-4.77*	1.06	174	HARDLY EVER
72.11	1.06	-2.67*	0.64	209	MONTHLY
75.28	0.66	0.50	0.40	782	WEEKLY
75.54	0.57	0.76*	0.21	1520	DAILY
----ENCOURAGEMENT FROM PARENTS - SCHOOL WORK----					
73.63	1.58	-1.15	1.45	80	HARDLY ANY
72.01	0.90	-2.76*	0.69	426	ONLY A LITTLE
75.04	0.63	0.25	0.28	1249	QUITE A BIT
75.84	0.60	1.05*	0.36	988	A LOT
----DO YOU LIKE YOUR SCHOOL? ----					
71.68	1.36	-3.10*	1.17	130	I HATE IT
72.65	1.32	-2.13*	1.04	223	I DON'T LIKE IT
73.52	0.61	-1.26*	0.29	1312	IT'S OK
77.54	0.64	2.76*	0.43	775	I LIKE IT
76.24	1.14	1.45	0.82	303	I LIKE IT A LOT
----HOW MANY HOURS PER DAY WATCHING TV? ----					
78.72	1.49	3.94*	1.23	131	LESS THAN 1 HR
78.19	0.68	3.41*	0.65	442	BETWEEN 1+2 HRS
76.57	0.81	1.79*	0.33	642	BETWEEN 2+3 HRS
74.69	0.73	-0.10	0.46	756	BETWEEN 3+4 HRS
70.36	0.73	-4.42*	0.53	769	MORE THAN 4 HRS
----HOW MUCH DO YOU LIKE MATH? ----					
70.75	0.99	-4.03*	0.75	335	NOT AT ALL
74.32	0.54	-0.46*	0.23	1581	SOMEWHAT
77.36	0.75	2.58*	0.46	826	VERY MUCH
----MATH USEFUL COMPARED TO OTHER SUBJECTS ----					
70.00	1.41	-4.79*	1.12	97	NOT VERY USEFUL
73.27	0.60	-1.51*	0.28	1194	SOMEWHAT USEFUL
76.38	0.57	1.60*	0.23	1454	VERY USEFUL



NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
CONNECTICUT STATEWIDE ASSESSMENT - 8TH GRADE - NOVEMBER 1976

1 TOTAL TEST SCORE

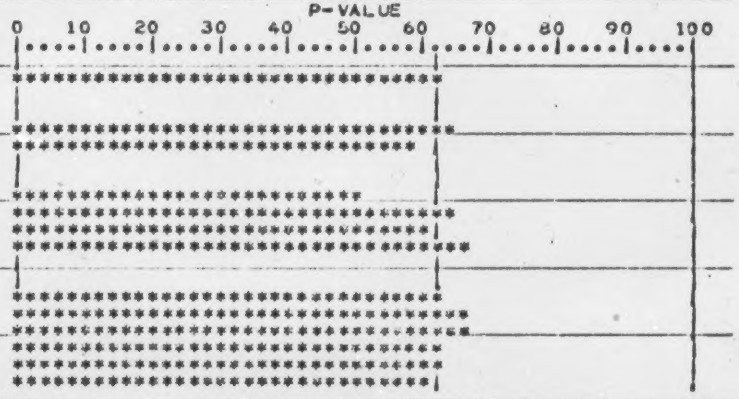
P-VALUE	SE OF P-VALUE	GROUP EFFECT	SE OF EFFECT	SAMPLE SIZE	REPORTING GROUP
74.78	0.49			2745	ALL STUDENTS
----CONSULTANTS OR SPECIALISTS ----					
74.57	0.88	-0.22	0.78	860	YES
75.10	0.65	0.32	0.34	1864	NO
----STUDENTS ASSIGNED BY ACHIEVEMENT LEVEL ----					
75.02	0.56	0.24	0.42	1842	YES
74.08	1.21	-0.70	0.95	878	NO
0.0	0.0	-74.78*	0.44	0	BOTH
----TYPICAL MATH CLASSROOM ----					
74.70	0.60	-0.08	0.33	2019	TEACHER CENTERED
75.17	1.39	0.39	1.25	522	INDIVIDUALIZED
----CURRICULUM OR PROGRAM DEVELOPMENT ----					
74.84	0.61	0.06	0.32	2005	YES
74.64	1.00	-0.14	0.87	740	NO
----CLASS SIZE TOO LARGE ----					
74.71	0.89	-0.08	0.78	794	YES
75.64	0.56	0.86*	0.42	1749	NO
----SIZE OF COMMUNITY ----					
62.43	1.22	-12.35*	1.09	669	BIG CITIES
77.80	0.81	3.02*	0.73	697	FRINGE CITIES
74.29	0.92	-0.49	0.80	688	MEDIUM CITIES
78.35	0.77	3.57*	0.61	691	SMALLER PLACES
----REGION OF THE STATE ----					
76.87	1.31	2.09	1.21	323	RESCUE
79.70	1.09	4.92*	1.02	306	COOP ED SERVICES
77.64	0.92	2.85*	0.82	552	CREC
76.94	0.70	2.16*	0.69	527	ACES
75.48	1.33	0.69	1.24	301	PROJECT LEARN
71.67	3.28	-3.11	3.15	67	NARSES



NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
CONNECTICUT STATEWIDE ASSESSMENT - 8TH GRADE - NOVEMBER 1976

GOAL 1 MATHEMATICAL CONCEPTS

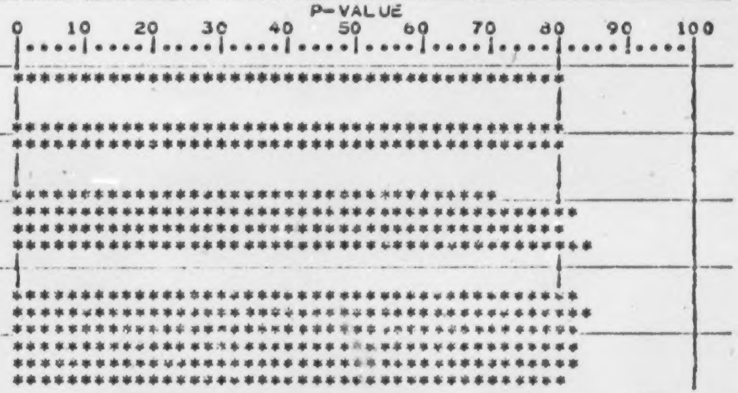
P-VALUE	SE OF P-VALUE	GROUP EFFECT	SE OF EFFECT	SAMPLE SIZE	REPORTING GROUP
61.24	0.60			2745	ALL STUDENTS
----SEX OF THE STUDENT ----					
64.58	0.77	3.34*	0.41	1255	MALE
58.40	0.70	-2.84*	0.34	1490	FEMALE
----SIZE OF THE COMMUNITY ----					
49.05	1.28	-12.19*	1.15	669	BIG CITIES
63.98	1.13	2.75*	0.96	697	FRINGE CITIES
60.26	1.22	-0.98	1.03	688	MEDIUM CITIES
65.25	0.93	4.01*	0.74	691	SMALLER PLACES
----REGION OF THE STATE ----					
61.99	1.66	0.76	1.68	323	RESCUE
65.07	1.52	3.83*	1.40	306	COOP ED SERVICE
66.05	1.14	4.81*	1.00	552	CREC
62.45	0.93	1.21	0.88	527	ACES
61.79	1.80	0.55	1.65	301	PROJECT LEARN
59.98	3.36	-1.25	3.25	67	NARSES



NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
CONNECTICUT STATEWIDE ASSESSMENT - 8TH GRADE - NOVEMBER 1976

GOAL 2 COMPUTATION

P-VALUE	SE OF P-VALUE	GROUP EFFECT	SE OF EFFECT	SAMPLE SIZE	REPORTING GROUP
80.07	0.50			2745	ALL STUDENTS
----SEX OF THE STUDENT ----					
79.93	0.60	-0.14	0.30	1255	MALE
80.20	0.60	0.13	0.25	1490	FEMALE
----SIZE OF THE COMMUNITY ----					
69.52	1.21	-10.55*	1.08	669	BIG CITIES
82.64	0.80	2.57*	0.73	697	FRINGE CITIES
79.45	1.02	-0.62	0.87	688	MEDIUM CITIES
83.26	0.81	3.19*	0.63	691	SMALLER PLACES
----REGION OF THE STATE ----					
82.21	1.52	2.14	1.37	323	RESCUE
84.93	0.99	4.86*	0.96	306	COOP ED SERVICE
81.26	0.97	1.19	0.85	552	CREC
81.97	0.76	1.89*	0.73	527	ACES
81.15	1.49	1.07	1.36	301	PROJECT LEARN
79.54	3.29	-0.43	3.17	67	NARSES



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            NATIONAL EVALUATION SYSTEMS. INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
                 CONNECTICUT STATEWIDE ASSESSMENT - 8TH GRADE - NOVEMBER 1976

                 GOAL  3  MEASUREMENT
                                                                                                   P-VALUE
           SE OF    GROUP      SE CF   SAMPLE                                      0    10   20   30   40   50   60   70   80   90  100
P-VALUE  P-VALUE   EFFECT     EFFECT    SIZE          REPORTING GROUP              |....|....|....|....|....|....|....|....|....|....|

 72.22     0.63                         2745          ALL  STUDENTS                ************************************

----SEX OF THE STUDENT                          ----
 77.23     0.70     5.01*      0.31     1255          MALE                         ***************************************
 67.95     0.76    -4.27*      0.31     1490          FEMALE                       **********************************

----SIZE OF THE COMMUNITY                       ----
 56.06     1.44   -16.16*      1.32      669          BIG CITIES                   ****************************
 76.33     1.15     4.11*      1.00      697          FRINGE CITIES                **************************************
 71.19     1.06    -1.03       0.96      688          MEDIUM CITIES                ************************************
 77.02     1.07     4.80*      0.81      691          SMALLER PLACES               ***************************************

----REGION OF THE STATE                         ----
 74.90     1.49     2.68       1.42      323          RESCUE                       *************************************
 78.54     1.36     6.32*      1.29      306          COOP ED SERVICE              ***************************************
 76.39     1.23     4.17*      1.08      552          CREC                         **************************************
 75.28     1.11     3.06*      1.03      527          ACES                         **************************************
 72.67     1.84     0.45       1.71      301          PROJECT LEARN                ************************************
 66.06     4.18    -6.16       4.02       67          NARSES                       *********************************
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            NATIONAL EVALUATION SYSTEMS. INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
                 CONNECTICUT STATEWIDE ASSESSMENT - 8TH GRADE - NOVEMBER 1976

                 GOAL  4  CHARTS AND GRAPHS
                                                                                                   P-VALUE
           SE OF    GROUP      SE CF   SAMPLE                                      0    10   20   30   40   50   60   70   80   90  100
P-VALUE  P-VALUE   EFFECT     EFFECT    SIZE          REPORTING GROUP              |....|....|....|....|....|....|....|....|....|....|

 89.13     0.42                         2745          ALL  STUDENTS                *********************************************

----SEX OF THE STUDENT                          ----
 89.38     0.54     0.24       0.31     1255          MALE                         *********************************************
 88.93     0.54    -0.21       0.26     1490          FEMALE                       ********************************************

----SIZE OF THE COMMUNITY                       ----
 79.57     1.37    -9.56*      1.22      669          BIG CITIES                   ****************************************
 91.26     0.52     2.13*      0.51      697          FRINGE CITIES                **********************************************
 89.00     0.80    -0.13       0.68      688          MEDIUM CITIES                *********************************************
 91.86     0.75     2.73*      0.54      691          SMALLER PLACES               **********************************************

----REGION OF THE STATE                         ----
 91.97     0.89     2.84*      0.84      323          RESCUE                       **********************************************
 92.01     1.03     2.88*      0.95      306          COOP ED SERVICE              **********************************************
 91.00     0.66     1.87*      0.61      552          CREC                         **********************************************
 91.28     0.83     2.14*      0.72      527          ACES                         **********************************************
 89.26     1.23     0.13       1.12      301          PROJECT LEARN                *********************************************
 85.82     3.20    -3.31       3.08       67          NARSES                       *******************************************
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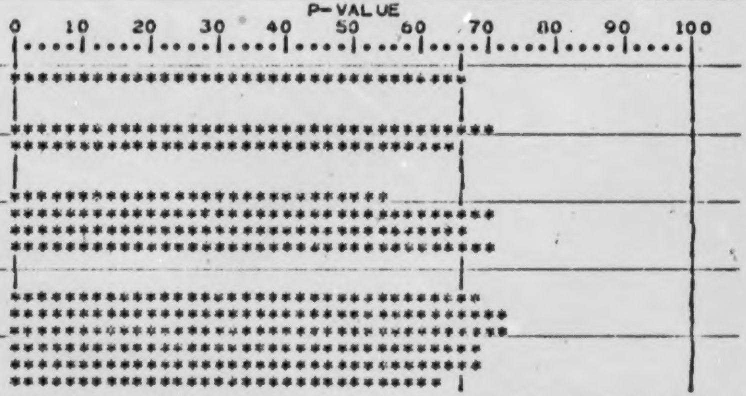
NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
CONNECTICUT STATEWIDE ASSESSMENT - 8TH GRADE - NOVEMBER 1976

GOAL 5 APPLICATIONS

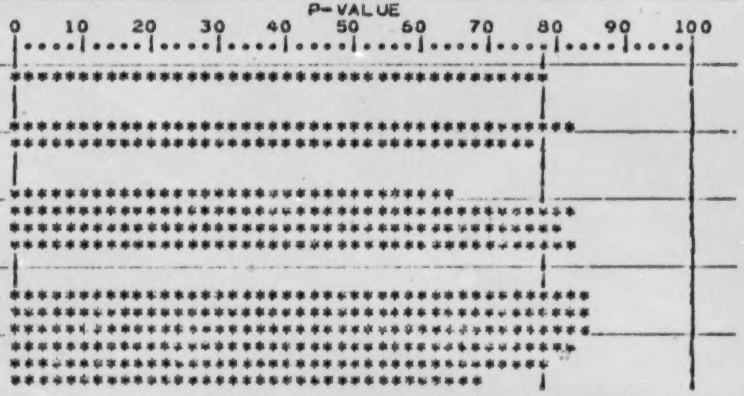
P-VALUE	SE OF P-VALUE	GROUP EFFECT	SE OF EFFECT	SAMPLE SIZE	REPORTING GROUP
65.93	0.60			2745	ALL STUDENTS
----SEX OF THE STUDENT ----					
70.35	0.71	3.42*	0.37	1255	MALE
64.02	0.72	-2.91*	0.31	1490	FEMALE
----SIZE OF THE COMMUNITY ----					
53.89	1.44	-13.04*	1.29	669	BIG CITIES
70.57	1.10	3.63*	0.94	697	FRINGE CITIES
66.87	1.11	-0.06	0.97	688	MEDIUM CITIES
70.09	0.99	3.16*	0.76	691	SMALLER PLACES
----REGION OF THE STATE ----					
68.15	1.55	1.22	1.42	323	RESCUE
72.06	1.74	5.13*	1.57	306	COOP ED SERVICE
71.27	1.19	4.34*	1.04	552	CREC
68.62	0.88	1.68*	0.86	527	ACES
67.91	1.54	0.97	1.43	301	PROJECT LEARN
61.79	3.28	-5.14	3.17	67	NARSES



NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
CONNECTICUT STATEWIDE ASSESSMENT - 8TH GRADE - NOVEMBER 1976

GOAL 6 GEOMETRY

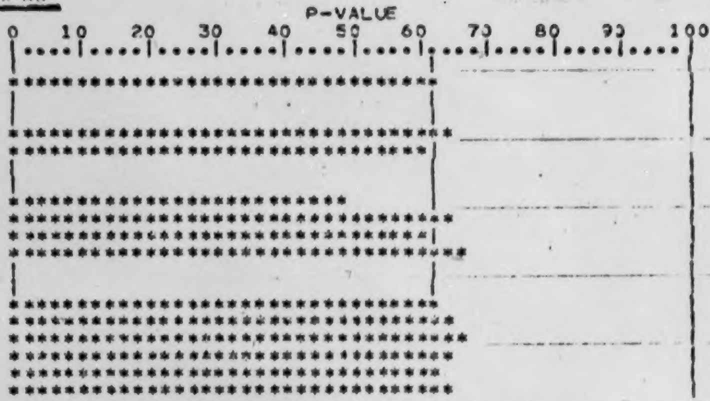
P-VALUE	SE OF P-VALUE	GROUP EFFECT	SE OF EFFECT	SAMPLE SIZE	REPORTING GROUP
78.86	0.72			2745	ALL STUDENTS
----SEX OF THE STUDENT ----					
81.36	0.84	2.49*	0.39	1255	MALE
76.74	0.84	-2.13*	0.34	1490	FEMALE
----SIZE OF THE COMMUNITY ----					
63.65	1.67	-15.22*	1.44	669	BIG CITIES
81.75	1.08	2.89*	0.98	697	FRINGE CITIES
80.21	1.24	1.34	1.11	688	MEDIUM CITIES
82.57	1.20	3.70*	0.92	691	SMALLER PLACES
----REGION OF THE STATE ----					
83.05	1.59	4.19*	1.47	323	RESCUE
83.82	1.78	4.96*	1.65	306	COOP ED SERVICE
83.03	1.24	4.17*	1.12	552	CREC
82.94	1.03	4.07*	1.01	527	ACES
77.61	1.49	-1.25	1.45	301	PROJECT LEARN
67.54	2.76	-11.33*	2.71	67	NARSES



NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
CONNECTICUT STATEWIDE ASSESSMENT - 8TH GRADE - NOVEMBER 1976

OBJECTIVE 1 STUDENT DEMONSTRATES UNDERSTANDING OF RATIONAL NUMBERS

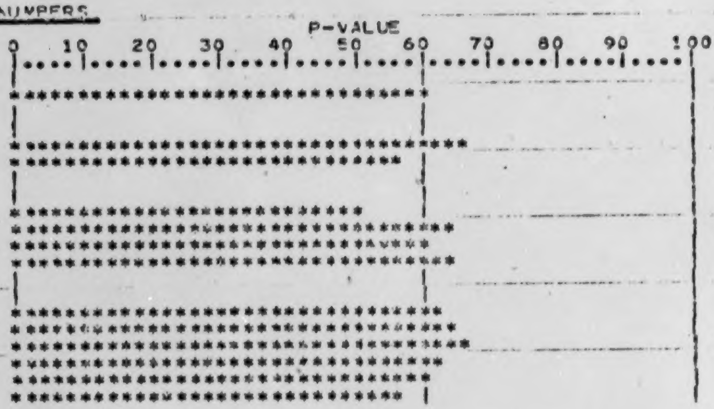
P-VALUE	SE OF P-VALUE	GROUP EFFECT	SE OF EFFECT	SAMPLE SIZE	REPORTING GROUP
61.47	0.77			2745	ALL STUDENTS
----SEX OF THE STUDENT					----
63.14	0.93	1.66*	0.45	1255	MALE
60.06	0.90	-1.41*	0.37	1490	FEMALE
----SIZE OF THE COMMUNITY					----
47.84	1.67	-13.64*	1.50	669	BIG CITIES
64.35	1.29	2.88*	1.14	697	FRINGE CITIES
60.51	1.57	-0.96	1.33	688	MEDIUM CITIES
66.00	1.33	4.52*	1.00	691	SMALLER PLACES
----REGION OF THE STATE					----
61.86	2.25	0.38	2.05	323	RESCUE
64.76	1.90	3.28	1.77	306	COOP ED SERVICE
66.53	1.40	5.06*	1.25	552	CREC
63.12	1.32	1.65	1.18	527	ACES
62.67	2.46	1.20	2.22	301	PROJECT LEARN
63.43	5.93	1.96	5.69	67	NARSES



NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
CONNECTICUT STATEWIDE ASSESSMENT - 8TH GRADE - NOVEMBER 1976

OBJECTIVE 2 STUDENT DEMONSTRATES UNDERSTANDING OF ORDERING OF NUMBERS

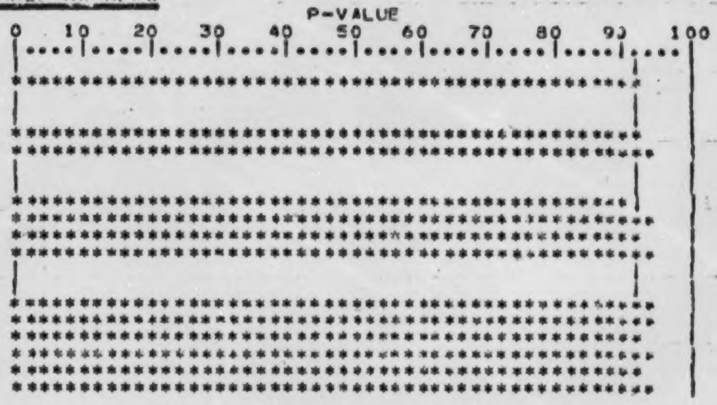
P-VALUE	SE OF P-VALUE	GROUP EFFECT	SE OF EFFECT	SAMPLE SIZE	REPORTING GROUP
60.51	0.57			2745	ALL STUDENTS
----SEX OF THE STUDENT					----
65.54	0.78	5.03*	0.48	1255	MALE
56.21	0.72	-4.23*	0.41	1490	FEMALE
----SIZE OF THE COMMUNITY					----
49.74	1.06	-10.76*	0.98	669	BIG CITIES
63.13	1.15	2.63*	0.95	697	FRINGE CITIES
59.53	1.14	-0.98	0.96	688	MEDIUM CITIES
63.97	0.93	3.46*	0.71	691	SMALLER PLACES
----REGION OF THE STATE					----
61.65	1.69	1.15	1.52	323	RESCUE
64.90	1.45	4.39*	1.32	306	COOP ED SERVICE
65.05	1.26	4.54*	1.06	552	CREC
61.27	1.00	0.76	0.92	527	ACES
60.39	1.54	-0.12	1.43	301	PROJECT LEARN
55.97	1.93	-4.54*	1.91	67	NARSES



NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
CONNECTICUT STATEWIDE ASSESSMENT - 8TH GRADE - NOVEMBER 1976

OBJECTIVE 3 STUDENT DEMONSTRATES ABILITY TO ADD AND SUBTRACT WHOLE NUMBERS

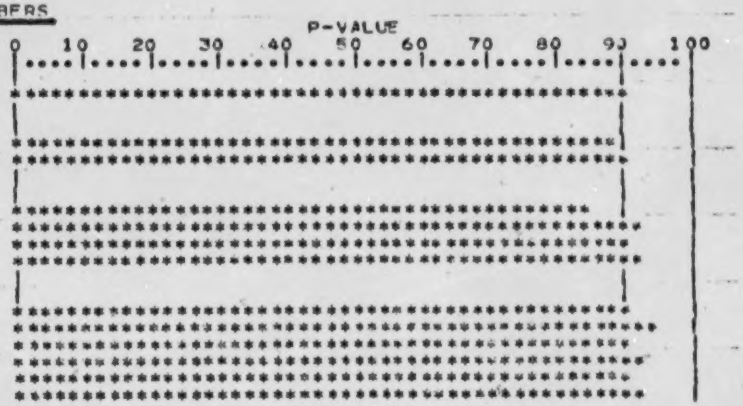
P-VALUE	SE OF P-VALUE	GROUP EFFECT	SE OF EFFECT	SAMPLE SIZE	REPORTING GROUP
92.84	0.27			2745	ALL STUDENTS
----SEX OF THE STUDENT ----					
92.55	0.40	-0.29	0.26	1255	MALE
93.08	0.38	0.25	0.22	1490	FEMALE
----SIZE OF THE COMMUNITY ----					
89.25	0.69	-3.59*	0.61	669	BIG CITIES
93.73	0.48	0.89*	0.40	697	FRINGE CITIES
92.31	0.55	-0.53	0.45	688	MEDIUM CITIES
94.11	0.47	1.27*	0.33	691	SMALLER PLACES
----REGION OF THE STATE ----					
94.60	0.75	1.76*	0.68	323	RESCUE
93.08	0.69	0.25	0.63	306	COOP ED SERVICE
92.99	0.59	0.15	0.49	552	CREC
94.00	0.50	1.17*	0.44	527	ACES
92.75	0.79	-0.08	0.72	301	PROJECT LEARN
93.66	1.59	0.82	1.54	67	NARSES



NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
CONNECTICUT STATEWIDE ASSESSMENT - 8TH GRADE - NOVEMBER 1976

OBJECTIVE 4 STUDENT DEMONSTRATES ABILITY TO MULTIPLY WHOLE NUMBERS

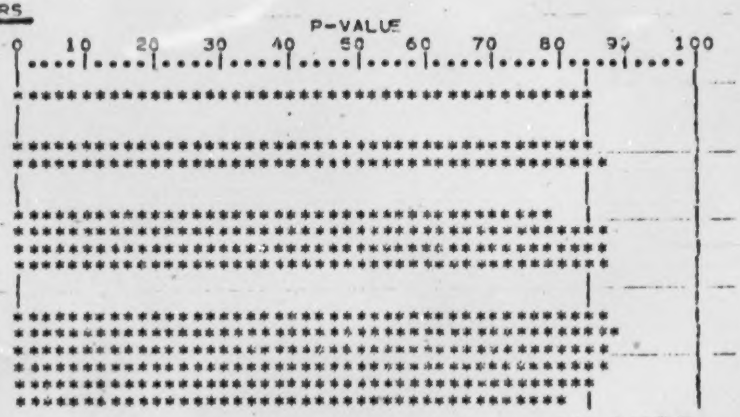
P-VALUE	SE OF P-VALUE	GROUP EFFECT	SE OF EFFECT	SAMPLE SIZE	REPORTING GROUP
89.93	0.38			2745	ALL STUDENTS
----SEX OF THE STUDENT ----					
88.74	0.57	-1.19*	0.35	1255	MALE
90.95	0.50	1.02*	0.28	1490	FEMALE
----SIZE OF THE COMMUNITY ----					
83.49	1.11	-6.44*	0.99	669	BIG CITIES
91.19	0.71	1.26*	0.59	697	FRINGE CITIES
89.95	0.72	0.01	0.62	688	MEDIUM CITIES
91.83	0.67	1.90*	0.48	691	SMALLER PLACES
----REGION OF THE STATE ----					
90.37	1.02	0.43	0.92	323	RESCUE
93.31	0.69	3.38*	0.67	306	COOP ED SERVICE
90.33	0.94	0.40	0.76	552	CREC
91.94	0.71	2.01*	0.63	527	ACES
89.91	0.59	-0.02	0.91	301	PROJECT LEARN
91.04	2.30	1.11	2.22	67	NARSES



NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
CONNECTICUT STATEWIDE ASSESSMENT - 8TH GRADE - NOVEMBER 1976

OBJECTIVE 5 STUDENT DEMONSTRATES ABILITY TO DIVIDE WHOLE NUMBERS

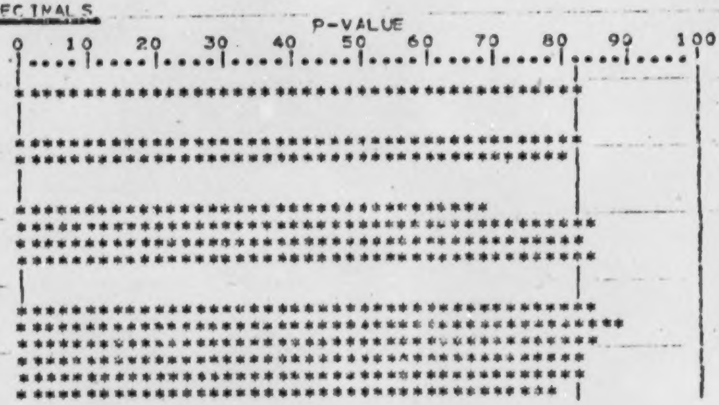
P-VALUE	SE OF P-VALUE	GROUP EFFECT	SE OF EFFECT	SAMPLE SIZE	REPORTING GROUP
84.82	0.51			2745	ALL STUDENTS
----SEX OF THE STUDENT					----
84.33	0.66	-0.49	0.36	1255	MALE
85.24	0.63	0.42	0.29	1490	FEMALE
----SIZE OF THE COMMUNITY					----
78.18	1.25	-6.63*	1.16	669	BIG CITIES
86.20	1.05	1.38	0.85	697	FRINGE CITIES
85.04	0.98	0.22	0.83	688	MEDIUM CITIES
86.58	0.89	1.76*	0.65	691	SMALLER PLACES
----REGION OF THE STATE					----
86.72	1.53	1.90	1.37	323	RESCUE
88.37	0.90	3.55*	0.88	306	COOP ED SERVICE
86.24	0.98	1.42	0.85	552	CREC
86.32	1.05	1.50	0.90	527	ACES
84.19	1.55	-0.62	1.40	301	PROJECT LEARN
79.10	3.58	-5.71	3.83	67	NARSES



NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
CONNECTICUT STATEWIDE ASSESSMENT - 8TH GRADE - NOVEMBER 1976

OBJECTIVE 6 STUDENT DEMONSTRATES ABILITY TO ADD AND SUBTRACT DECIMALS

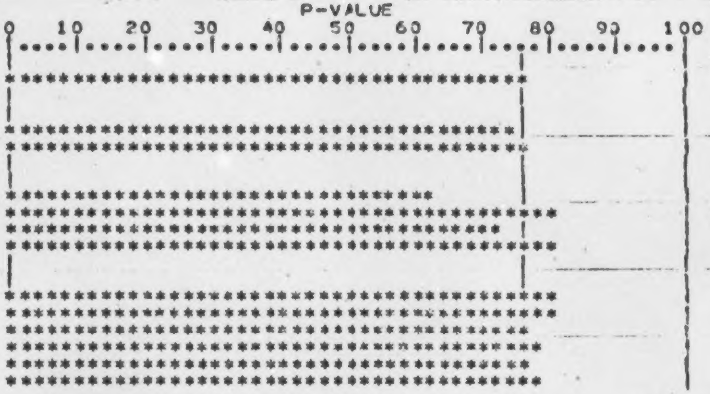
P-VALUE	SE OF P-VALUE	GROUP EFFECT	SE OF EFFECT	SAMPLE SIZE	REPORTING GROUP
81.01	0.59			2745	ALL STUDENTS
----SEX OF THE STUDENT					----
81.63	0.77	0.63	0.43	1255	MALE
80.48	0.74	-0.53	0.36	1490	FEMALE
----SIZE OF THE COMMUNITY					----
68.99	1.51	-12.02*	1.34	669	BIG CITIES
83.80	1.02	2.79*	0.90	697	FRINGE CITIES
81.55	1.09	0.54	0.94	688	MEDIUM CITIES
83.90	1.01	2.90*	0.75	691	SMALLER PLACES
----REGION OF THE STATE					----
83.90	1.58	2.89*	1.45	323	RESCUE
87.06	1.22	6.05*	1.16	306	COOP ED SERVICE
83.87	1.07	2.86*	0.94	552	CREC
82.11	1.20	1.11	1.04	527	ACES
81.10	1.67	0.09	1.52	301	PROJECT LEARN
77.24	2.18	-3.77	2.16	67	NARSES



NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
CONNECTICUT STATEWIDE ASSESSMENT - 8TH GRADE - NOVEMBER 1976

OBJECTIVE 7 STUDENT DEMONSTRATES ABILITY TO MULTIPLY DECIMALS

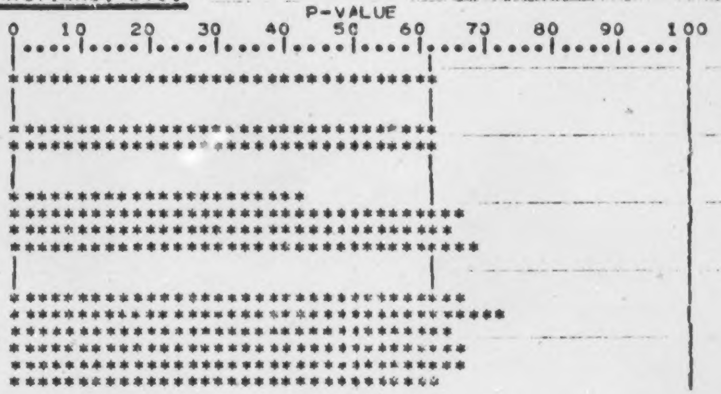
P-VALUE	SE OF P-VALUE	GROUP EFFECT	SE OF EFFECT	SAMPLE SIZE	REPORTING GROUP
75.33	0.73			2745	ALL STUDENTS
----SEX OF THE STUDENT					----
74.57	0.92	-0.76	0.46	1255	MALE
75.98	0.87	0.65	0.39	1490	FEMALE
----SIZE OF THE COMMUNITY					----
61.93	1.69	-13.40*	1.49	669	BIG CITIES
79.99	1.18	4.67*	1.04	697	FRINGE CITIES
72.50	1.35	-2.82*	1.18	688	MEDIUM CITIES
79.67	1.28	4.34*	0.95	691	SMALLER PLACES
----REGION OF THE STATE					----
80.00	2.06	4.68*	1.87	323	RESCUE
80.87	1.42	5.55*	1.39	306	COOP ED SERVICE
75.22	1.57	-0.10	1.34	552	CREC
78.33	1.43	3.00*	1.27	527	ACES
75.87	1.90	0.54	1.79	301	PROJECT LEARN
78.73	4.76	3.40	4.59	67	NARSES



NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
CONNECTICUT STATEWIDE ASSESSMENT - 8TH GRADE - NOVEMBER 1976

OBJECTIVE 8 STUDENT DEMONSTRATES ABILITY TO ADD AND SUBTRACT FRACTIONS, ETC.

P-VALUE	SE OF P-VALUE	GROUP EFFECT	SE OF EFFECT	SAMPLE SIZE	REPORTING GROUP
62.71	1.18			2745	ALL STUDENTS
----SEX OF THE STUDENT					----
62.80	1.48	0.10	0.73	1255	MALE
62.63	1.37	-0.08	0.61	1490	FEMALE
----SIZE OF THE COMMUNITY					----
42.79	2.53	-19.91*	2.22	669	BIG CITIES
66.72	1.96	4.02*	1.76	697	FRINGE CITIES
63.02	2.49	0.31	2.11	688	MEDIUM CITIES
68.31	1.96	5.61*	1.52	691	SMALLER PLACES
----REGION OF THE STATE					----
66.01	3.67	3.30	3.29	323	RESCUE
72.77	3.18	10.06*	2.92	306	COOP ED SERVICE
64.66	2.22	1.95	1.97	552	CREC
65.34	1.73	2.64	1.68	527	ACES
66.27	3.39	3.57	3.09	301	PROJECT LEARN
62.69	7.56	-0.02	7.29	67	NARSES



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                    NATIONAL EVALUATION SYSTEMS. INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
                      CONNECTICUT STATEWIDE ASSESSMENT - 8TH GRADE - NOVEMBER 1976
           OBJECTIVE  9  STUDENT DEMONSTRATES ABILITY TO MULTIPLY FRACTIONS AND MIXED NUMBERS
                                                                                                  P-VALUE
             SE OF     GROUP     SE OF    SAMPLE                                  0    10   20   30   40   50   60   70   80   90   100
 P-VALUE   P-VALUE    EFFECT    EFFECT     SIZE          REPORTING GROUP         |....|....|....|....|....|....|....|....|....|....|
   74.14     0.83                          2745          ALL STUDENTS            *************************************             |
----SEX OF THE STUDENT                                                           |                                    |            |
   75.19     1.02      1.04*     0.51      1255   ----   MALE                    **************************************            |
   73.26     0.98     -0.89*     0.43      1490          FEMALE                  *************************************             |
----SIZE OF THE COMMUNITY                                                        |                                    |            |
   62.08     1.69    -12.07*     1.54       669   ----   BIG CITIES              *******************************      |            |
   77.05     1.38      2.91*     1.23       697          FRINGE CITIES           ***************************************           |
   72.03     1.71     -2.11      1.45       688          MEDIUM CITIES           ************************************|             |
   78.69     1.52      4.55*     1.11       691          SMALLER PLACES          ***************************************           |
----REGION OF THE STATE                                                          |                                    |            |
   74.02     2.72     -0.12      2.43       323   ----   RESCUE                  *************************************             |
   79.34     2.19      5.19*     2.02       306          COOP ED SERVICE         ****************************************          |
   75.63     1.69      1.48      1.46       552          CREC                    **************************************            |
   75.94     1.40      1.79      1.30       527          ACES                    **************************************            |
   78.28     2.65      4.14      2.38       301          PROJECT LEARN           ***************************************           |
   75.37     4.25      1.23      4.12        67          NARSES                  **************************************            |
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                    NATIONAL EVALUATION SYSTEMS. INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
                      CONNECTICUT STATEWIDE ASSESSMENT - 8TH GRADE - NOVEMBER 1976
           OBJECTIVE 10  STUDENT DEMONSTRATES WORKING KNOWLEDGE OF AREA AND PERIMETER
                                                                                                  P-VALUE
             SE OF     GROUP     SE OF    SAMPLE                                  0    10   20   30   40   50   60   70   80   90   100
 P-VALUE   P-VALUE    EFFECT    EFFECT     SIZE          REPORTING GROUP         |....|....|....|....|....|....|....|....|....|....|
   65.69     0.71                          2745          ALL STUDENTS            *********************************                 |
----SEX OF THE STUDENT                                                           |                                |                |
   68.91     0.90      3.23*     0.50      1255   ----   MALE                    **********************************                |
   62.94     0.87     -2.75*     0.42      1490          FEMALE                  *******************************  |                |
----SIZE OF THE COMMUNITY                                                        |                                |                |
   52.14     1.33    -13.55*     1.25       669   ----   BIG CITIES              **************************       |                |
   68.80     1.33      3.12*     1.13       697          FRINGE CITIES           **********************************                |
   63.93     1.26     -1.76      1.11       688          MEDIUM CITIES           ********************************|                 |
   70.52     1.29      4.83*     0.95       691          SMALLER PLACES          ***********************************               |
----REGION OF THE STATE                                                          |                                |                |
   68.99     1.53      3.31      1.78       323   ----   RESCUE                  **********************************                |
   71.65     1.64      5.97*     1.54       306          COOP ED SERVICE         ************************************              |
   69.91     1.69      4.22*     1.42       552          CREC                    ***********************************               |
   66.36     1.24      0.68      1.14       527          ACES                    *********************************                 |
   66.23     2.05      0.54      1.90       301          PROJECT LEARN           *********************************                 |
   59.70     3.27     -5.98      3.19        67          NARSES                  ******************************   |                |
                 NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
                   CONNECTICUT STATEWIDE ASSESSMENT - 8TH GRADE - NOVEMBER 1976

            OBJECTIVE 11  STUDENT DEMONSTRATES ABILITY TO CONVERT U.S. UNITS OF MEASURE

              SE OF     GROUP     SE OF    SAMPLE
 P-VALUE    P-VALUE    EFFECT    EFFECT     SIZE               REPORTING GROUP

  77.03       0.67                          2745               ALL STUDENTS

 ----SEX OF THE STUDENT                               ----
  82.52       0.73      5.48*     0.46      1255               MALE
  72.35       0.91     -4.68*     0.42      1490               FEMALE

 ----SIZE OF THE COMMUNITY                            ----
  62.19       1.82    -14.85*     1.58       669               BIG CITIES
  79.71       1.27      2.67*     1.08       697               FRINGE CITIES
  76.94       1.26     -0.10      1.09       688               MEDIUM CITIES
  81.66       0.96      4.63*     0.78       691               SMALLER PLACES

 ----REGION OF THE STATE                              ----
  76.47       1.86     -0.57      1.68       323               RESCUE
  80.03       1.49      3.00*     1.41       306               COOP ED SERVICE
  81.69       1.30      4.66*     1.12       552               CREC
  80.55       1.16      3.52*     1.07       527               ACES
  79.39       1.78      2.36      1.64       301               PROJECT LEARN
  76.49       1.96     -0.54      1.97        67               NARSES
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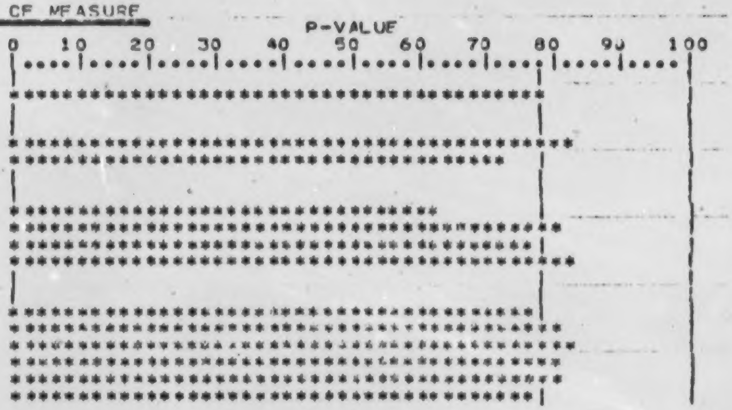

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                 NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
                   CONNECTICUT STATEWIDE ASSESSMENT - 8TH GRADE - NOVEMBER 1976

            OBJECTIVE 12  STUDENT DEMONSTRATES KNOWLEDGE OF METRIC UNITS OF MEASURE

              SE OF     GROUP     SE OF    SAMPLE
 P-VALUE    P-VALUE    EFFECT    EFFECT     SIZE               REPORTING GROUP

  73.91       0.94                          2745               ALL STUDENTS

 ----SEX OF THE STUDENT                               ----
  80.18       1.00      6.27*     0.46      1255               MALE
  68.55       1.11     -5.35*     0.42      1490               FEMALE

 ----SIZE OF THE COMMUNITY                            ----
  53.89       1.89    -20.01*     1.82       669               BIG CITIES
  80.39       1.45      6.48*     1.35       697               FRINGE CITIES
  72.61       1.70     -1.29      1.50       688               MEDIUM CITIES
  78.84       1.84      4.93*     1.31       691               SMALLER PLACES

 ----REGION OF THE STATE                              ----
  79.20       2.12      5.30*     2.02       323               RESCUE
  83.86       1.83      9.95*     1.78       306               COOP ED SERVICE
  77.44       1.76      3.54*     1.56       552               CREC
  78.88       1.74      4.97*     1.56       527               ACES
  72.37       2.73     -1.54      2.51       301               PROJECT LEARN
  61.94       8.95    -11.96      8.57        67               NARSES
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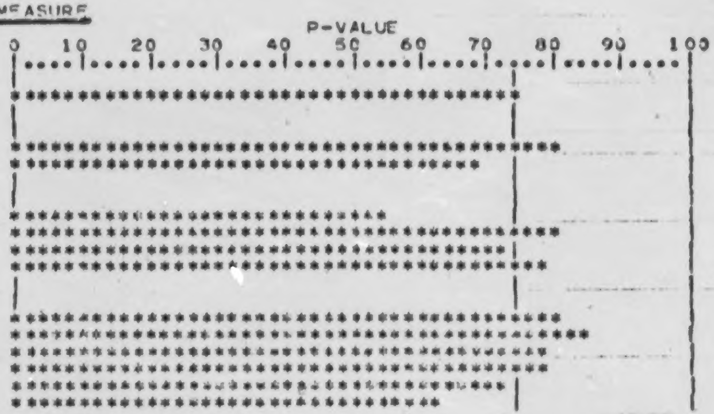
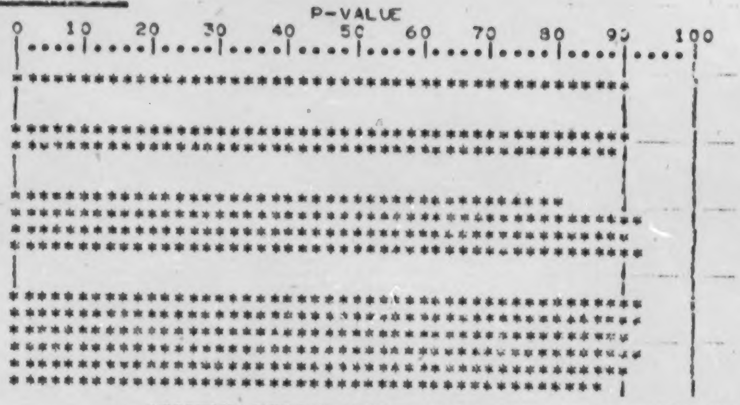


NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
CONNECTICUT STATEWIDE ASSESSMENT - 8TH GRADE - NOVEMBER 1976

OBJECTIVE 13 STUDENT DEMONSTRATES ABILITY TO INTERPRET CHARTS AND GRAPHS

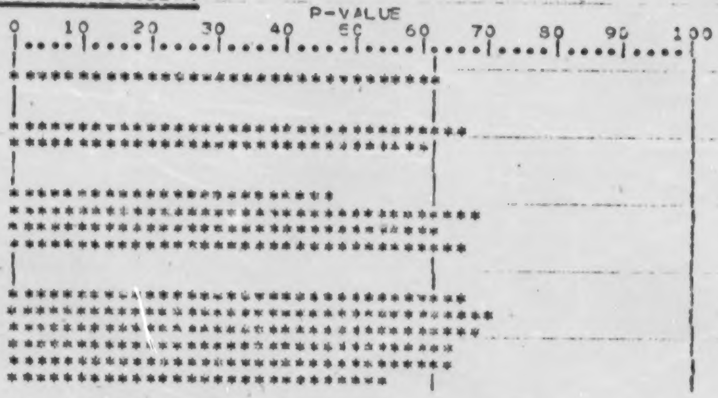
P-VALUE	SE OF P-VALUE	GROUP EFFECT	SE OF EFFECT	SAMPLE SIZE	REPORTING GROUP
89.13	0.42			2745	ALL STUDENTS
----SEX OF THE STUDENT					----
89.38	0.54	0.24	0.31	1255	MALE
88.93	0.54	-0.21	0.26	1490	FEMALE
----SIZE OF THE COMMUNITY					----
79.57	1.37	-9.56*	1.22	669	BIG CITIES
91.26	0.52	2.12*	0.51	697	FRINGE CITIES
89.00	0.80	-0.13	0.68	688	MEDIUM CITIES
91.86	0.75	2.73*	0.54	691	SMALLER PLACES
----REGION OF THE STATE					----
91.97	0.89	2.84*	0.84	323	RESCUE
92.01	1.03	2.88*	0.95	306	COOP ED SERVICE
91.00	0.66	1.87*	0.61	552	CREC
91.28	0.63	2.14*	0.72	527	ACES
89.26	1.23	0.13	1.12	301	PROJECT LEARN
85.82	3.20	-3.31	3.08	67	NARSES



NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
CONNECTICUT STATEWIDE ASSESSMENT - 8TH GRADE - NOVEMBER 1976

OBJECTIVE 14 STUDENT DEMONSTRATES ABILITY TO SOLVE WORD PROBLEMS (MATH SKILLS)

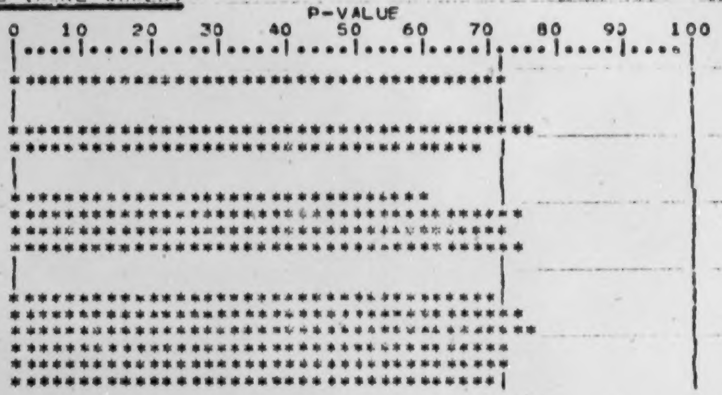
P-VALUE	SE OF P-VALUE	GROUP EFFECT	SE OF EFFECT	SAMPLE SIZE	REPORTING GROUP
62.63	0.77			2745	ALL STUDENTS
----SEX OF THE STUDENT					----
65.51	0.94	2.88*	0.47	1255	MALE
60.19	0.89	-2.45*	0.39	1490	FEMALE
----SIZE OF THE COMMUNITY					----
46.82	1.72	-15.81*	1.57	669	BIG CITIES
67.52	1.39	4.89*	1.15	697	FRINGE CITIES
61.69	1.44	-0.94	1.26	688	MEDIUM CITIES
66.66	1.35	4.03*	1.00	691	SMALLER PLACES
----REGION OF THE STATE					----
65.70	2.07	3.06	1.85	323	RESCUE
69.92	1.92	7.29*	1.76	306	COOP ED SERVICE
67.29	1.61	4.66*	1.38	552	CREC
64.33	1.16	1.70	1.11	527	ACES
63.45	2.06	0.82	1.91	301	PROJECT LEARN
53.43	3.84	-9.20*	3.73	67	NARSES



NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
CONNECTICUT STATEWIDE ASSESSMENT - 8TH GRADE - NOVEMBER 1976

OBJECTIVE 15 STUDENT DEMONSTRATES ABILITY TO SOLVE WORD PROBLEMS (REAL WORLD)

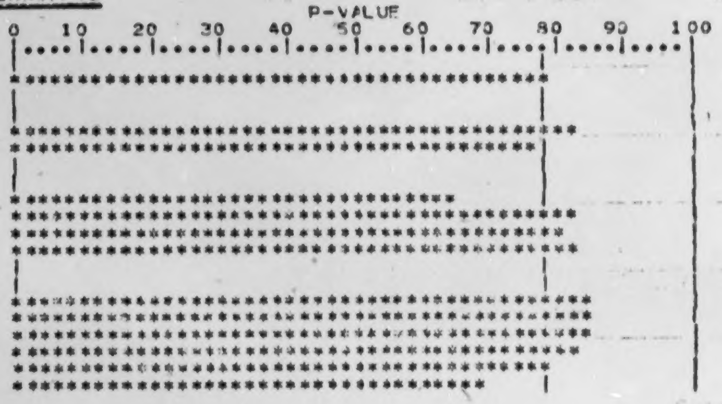
P-VALUE	SE OF P-VALUE	GROUP EFFECT	SE OF EFFECT	SAMPLE SIZE	REPORTING GROUP
71.24	0.55			2745	ALL STUDENTS
----SEX OF THE STUDENT					
75.19	0.68	3.96*	0.40	1255	MALE
67.86	0.71	-3.37*	0.34	1490	FEMALE
----SIZE OF THE COMMUNITY					
60.96	1.30	-10.28*	1.17	669	BIG CITIES
73.61	1.06	2.37*	0.88	697	FRINGE CITIES
72.04	1.00	0.81	0.87	688	MEDIUM CITIES
73.52	0.94	2.28*	0.70	691	SMALLER PLACES
----REGION OF THE STATE					
70.61	1.37	-0.63	1.26	323	RESCUE
74.21	1.72	2.97	1.54	306	COOP ED SERVICE
75.25	1.10	4.01*	0.94	552	CREC
72.90	0.94	1.66	0.86	527	ACES
72.36	1.50	1.12	1.36	301	PROJECT LEARN
70.15	3.09	-1.09	2.99	67	NARSES



NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
CONNECTICUT STATEWIDE ASSESSMENT - 8TH GRADE - NOVEMBER 1976

OBJECTIVE 16 STUDENT DEMONSTRATES KNOWLEDGE OF BASIC GEOMETRIC CONCEPTS

P-VALUE	SE OF P-VALUE	GROUP EFFECT	SE OF EFFECT	SAMPLE SIZE	REPORTING GROUP
78.86	0.72			2745	ALL STUDENTS
----SEX OF THE STUDENT					
81.36	0.84	2.49*	0.39	1255	MALE
76.74	0.84	-2.13*	0.34	1490	FEMALE
----SIZE OF THE COMMUNITY					
63.65	1.67	-15.22*	1.44	669	BIG CITIES
81.75	1.08	2.89*	0.98	697	FRINGE CITIES
80.21	1.24	1.34	1.11	688	MEDIUM CITIES
82.57	1.20	3.70*	0.92	691	SMALLER PLACES
----REGION OF THE STATE					
83.05	1.59	4.19*	1.47	323	RESCUE
83.82	1.78	4.96*	1.65	306	COOP ED SERVICE
83.03	1.24	4.17*	1.12	552	CREC
82.94	1.03	4.07*	1.01	527	ACES
77.61	1.49	-1.25	1.45	301	PROJECT LEARN
67.54	2.76	-11.33*	2.71	67	NARSES



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               NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
                    CONNECTICUT STATEWIDE ASSESSMENT - 11TH GRADE - APRIL 1977
                                  1   TOTAL TEST SCORE

            SE OF     GROUP      SE OF    SAMPLE
P-VALUE   P-VALUE    EFFECT     EFFECT     SIZE          REPORTING GROUP
 76.85      0.51                           2362          ALL STUDENTS

----SEX OF THE STUDENT                            ----
 79.86      0.61      3.01*      0.34      1021          MALE
 74.58      0.63     -2.26*      0.26      1339          FEMALE

----SOCIO-ECONOMIC STATUS                         ----
 71.61      0.83     -5.23*      0.55       760          LOW
 78.42      0.65      1.57*      0.43       792          MEDIUM
 80.41      0.60      3.56*      0.45       793          HIGH

----ENCOURAGEMENT FROM PARENTS - SCHOOL WORK----
 73.26      1.89     -3.59*      1.58       113          HARDLY ANY
 76.30      0.80     -0.54       0.67       492          ONLY A LITTLE
 77.05      0.66      0.20       0.36      1077          QUITE A BIT
 77.75      0.87      0.90       0.59       675          A LOT

----DO YOU LIKE YOUR SCHOOL?                      ----
 71.79      1.69     -5.06*      1.42       114          I HATE IT
 74.74      1.20     -2.10*      1.03       256          I DON'T LIKE IT
 75.49      0.59     -1.36*      0.34      1004          IT'S OK
 79.72      0.74      2.87*      0.52       723          I LIKE IT
 79.02      1.27      2.18*      0.92       260          I LIKE IT A LOT

----LEVEL OF SCHOOLING YOU WOULD LIKE             ----
 69.08      8.78     -7.77       8.77         4          NOT FINISH HS
 64.96      1.20    -11.89*      1.01       314          GRADUATE HS
 70.33      0.80     -6.51*      0.66       472          VOC SCHOOL
 73.10      0.94     -3.75*      0.81       317          2 YEAR COLLEGE
 81.71      0.88      4.86*      0.44       380          4 YEAR COLLEGE
 87.42      0.83     10.57*      0.65       368          GRADUATE SCHOOL

----HOW MANY HOURS PER DAY WATCHING TV?           ----
 81.25      0.82      4.41*      0.57       511          LESS THAN 1 HR
 78.76      0.71      1.91*      0.49       694          BETWEEN 1+2 HRS
 76.62      0.75     -0.22       0.61       535          BETWEEN 2+3 HRS
 73.96      1.02     -2.88*      0.80       354          BETWEEN 3+4 HRS
 67.36      1.37     -9.49*      1.07       235          MORE THAN 4 HRS

----HOW MUCH DO YOU LIKE MATH?                    ----
 70.66      0.81     -6.19*      0.59       527          NOT AT ALL
 76.93      0.57      0.08       0.26      1316          SOMEWHAT
 83.43      0.91      6.58*      0.64       516          VERY MUCH

----MATH USEFUL COMPARED TO OTHER SUBJECTS        ----
 71.33      1.42     -5.52*      1.06       207          NOT VERY USEFUL
 75.63      0.59     -1.21*      0.27      1306          SOMEWHAT USEFUL
 80.13      0.70      3.28*      0.44       847          VERY USEFUL
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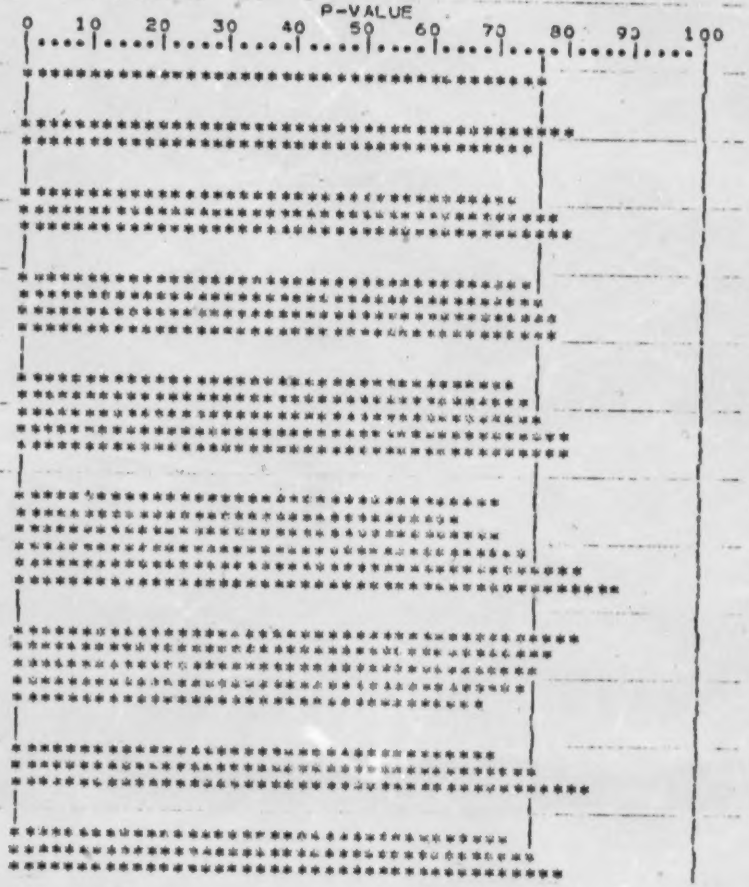

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NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
     CONNECTICUT STATEWIDE ASSESSMENT - 11TH GRADE - APRIL 1977

                                 1   TOTAL TEST SCORE

             SE OF      GROUP      SE OF    SAMPLE
P-VALUE     P-VALUE    EFFECT     EFFECT     SIZE              REPORTING GROUP

 76.85       0.51                            2362              ALL STUDENTS

----MATH USEFUL OUTSIDE OF SCHOOL                    ----
 77.17       0.73       0.32       0.46      705               NOT VERY USEFUL
 77.78       0.57       0.93*      0.31     1189               SOMEWHAT USEFUL
 74.16       1.07      -2.69*      0.75      463               VERY USEFUL

----HOW MANY YEARS HAVE YOU HAD MATH?                ----
 54.14       3.25     -22.71*      3.17        7               NONE
 59.70       1.26     -17.15*      1.17      152               1 YEAR
 68.50       0.84      -8.34*      0.63      567               2 YEARS
 81.45       0.47       4.60*      0.30     1629               3 YEARS

----CONSULTANTS OR SPECIALISTS                       ----
 77.81       0.88       0.97       0.79      612               YES
 76.45       0.63      -0.40       0.28     1720               NO

----STUDENTS ASSIGNED BY ACHIEVEMENT LEVEL           ----
 77.01       0.74       0.16       0.49     1398               YES
 76.62       0.94      -0.23       0.79      788               NO
 75.52       4.06      -1.33       3.92      103               BOTH

----CURRICULUM OR PROGRAM DEVELOPMENT                ----
 76.63       0.63      -0.22       0.36     1717               YES
 77.24       1.17       0.39       1.00      615               NO

----CLASS SIZE TOO LARGE                             ----
 75.15       1.24      -1.70       1.06      701               YES
 77.35       0.64       0.51       0.44     1615               NO

----SIZE OF COMMUNITY                                ----
 63.96       1.94     -12.89*      1.73      416               BIG CITIES
 78.37       0.84       1.52*      0.74      634               FRINGE CITIES
 78.99       0.79       2.15*      0.73      658               MEDIUM CITIES
 79.21       0.91       2.37*      0.70      654               SMALLER PLACES

----REGION OF THE STATE                              ----
 79.18       0.65       2.34*      0.84      357               RESCUE
 80.40       1.09       3.55*      1.03      352               COOP ED SERVICES
 80.02       0.85       3.17*      0.81      485               CREC
 75.78       1.44      -1.06       1.26      358               ACES
 78.34       1.36       1.49       1.22      329               PROJECT LEARN
 80.20       2.08       3.35       2.04       65               NARSES
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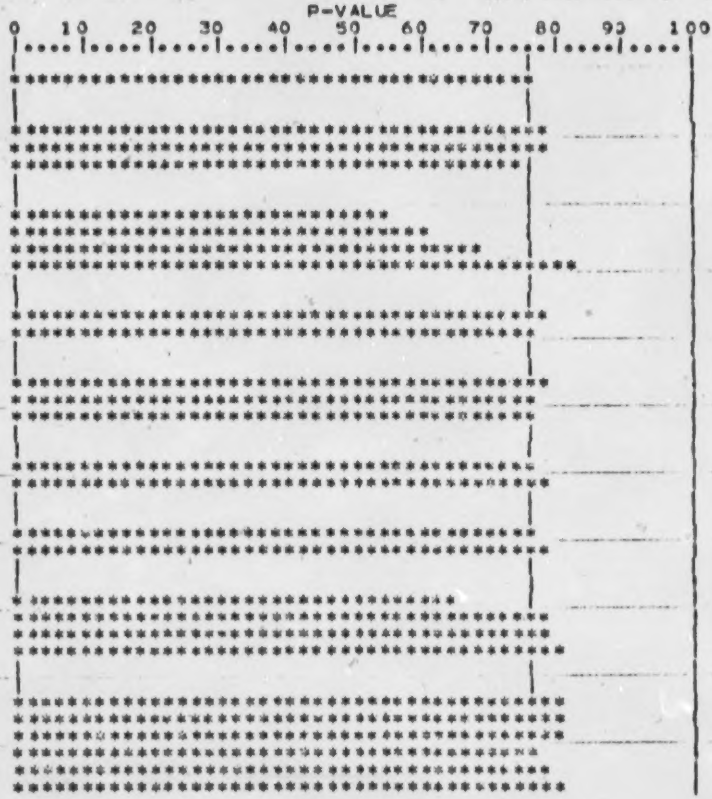

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                    NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
                         CONNECTICUT STATEWIDE ASSESSMENT - 11TH GRADE - APRIL 1977

                  GOAL  1  MATHEMATICAL CONCEPTS

            SE OF    GROUP      SE OF   SAMPLE
 P-VALUE  P-VALUE   EFFECT     EFFECT    SIZE                 REPORTING GROUP

  68.39     0.71                         2362                 ALL STUDENTS

 ----SEX OF THE STUDENT                             ----
  74.42     0.87      6.04*      0.54    1021                 MALE
  63.82     0.90     -4.57*      0.41    1339                 FEMALE

 ----SIZE OF THE COMMUNITY                          ----
  53.39     2.18    -15.00*      1.97     416                 BIG CITIES
  71.37     1.11      2.98*      1.01     634                 FRINGE CITIES
  69.77     1.09      1.38       1.00     658                 MEDIUM CITIES
  71.08     1.47      2.69*      1.06     654                 SMALLER PLACES

 ----REGION OF THE STATE                            ----
  70.29     1.55      1.90       1.42     357                 RESCUE
  74.68     1.58      6.29*      1.48     352                 COOP ED SERVICE
  72.76     1.14      4.37*      1.09     485                 CREC
  66.77     1.96     -1.62       1.73     358                 ACES
  68.25     2.00     -0.13       1.78     329                 PROJECT LEARN
  72.31     3.87      3.92       3.75      65                 NARSES
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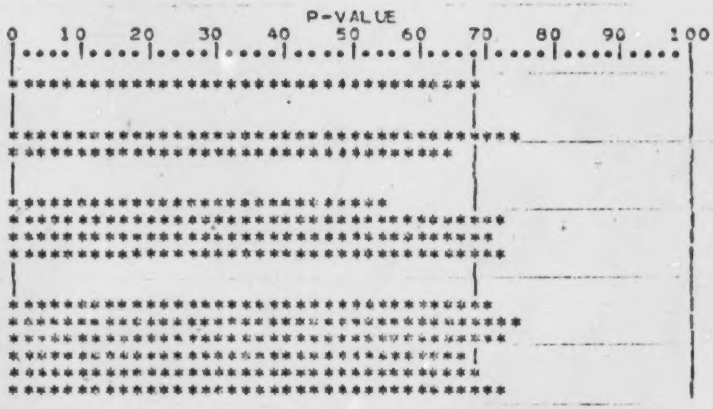

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                    NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
                         CONNECTICUT STATEWIDE ASSESSMENT - 11TH GRADE - APRIL 1977

                  GOAL  2  COMPUTATION

            SE OF    GROUP      SE OF   SAMPLE
 P-VALUE  P-VALUE   EFFECT     EFFECT    SIZE                 REPORTING GROUP

  82.37     0.47                         2362                 ALL STUDENTS

 ----SEX OF THE STUDENT                             ----
  82.69     0.56      0.33       0.32    1021                 MALE
  82.15     0.59     -0.21       0.24    1339                 FEMALE

 ----SIZE OF THE COMMUNITY                          ----
  72.62     1.72     -9.74*      1.54     416                 BIG CITIES
  83.64     0.83      1.27       0.71     634                 FRINGE CITIES
  84.08     0.88      1.72*      0.75     658                 MEDIUM CITIES
  83.99     0.76      1.63*      0.61     654                 SMALLER PLACES

 ----REGION OF THE STATE                            ----
  84.35     0.78      1.99*      0.76     357                 RESCUE
  84.85     0.94      2.48*      0.90     352                 COOP ED SERVICE
  84.60     0.96      2.23*      0.85     485                 CREC
  81.28     1.24     -1.09       1.10     358                 ACES
  84.10     1.29      1.73       1.15     329                 PROJECT LEARN
  84.46     2.24      2.09       2.18      65                 NARSES
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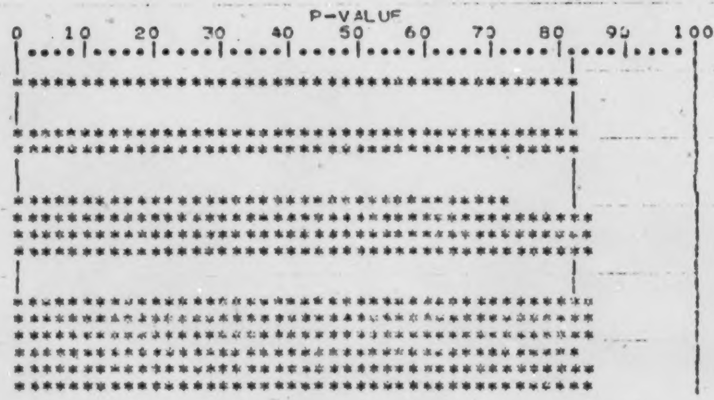
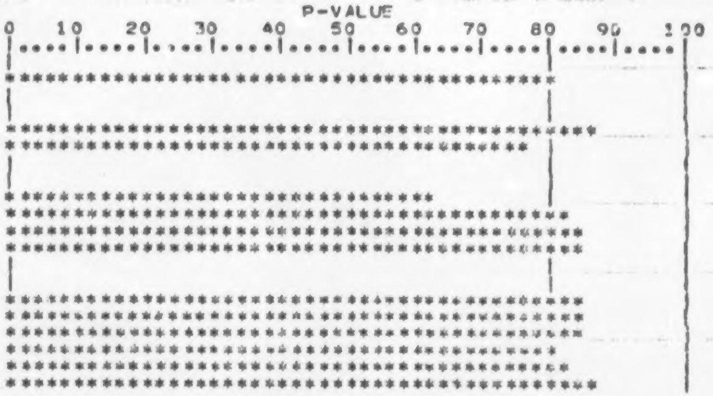


NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
CONNECTICUT STATEWIDE ASSESSMENT - 11TH GRADE - APRIL 1977

GOAL 3 MEASUREMENT

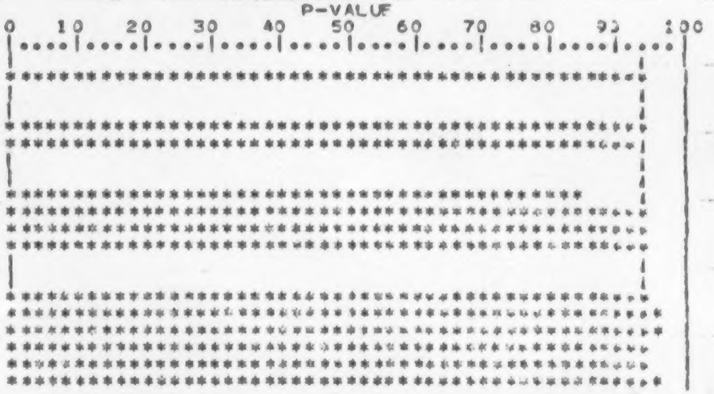
P-VALUE	SE OF P-VALUE	GROUP EFFECT	SE OF EFFECT	SAMPLE SIZE	REPORTING GROUP
80.35	0.62			2362	ALL STUDENTS
----SEX OF THE STUDENT ----					
85.93	0.67	5.55*	0.42	1021	MALE
76.15	0.81	-4.22*	0.32	1339	FEMALE
----SIZE OF THE COMMUNITY ----					
62.52	2.60	-17.85*	2.28	416	BIG CITIES
81.56	0.92	1.18	0.86	634	FRINGE CITIES
83.72	0.82	3.34*	0.80	658	MEDIUM CITIES
84.07	1.05	3.69*	0.83	654	SMALLER PLACES
----REGION OF THE STATE ----					
83.39	1.07	3.02*	1.07	357	RESCUE
84.39	1.22	4.01*	1.17	352	COOP ED SERVICE
84.46	0.82	4.03*	0.85	485	CREC
80.08	1.77	-0.29	1.55	358	ACES
82.57	1.44	2.19	1.31	329	PROJECT LEARN
86.08	2.11	5.70*	2.09	65	NARSES



NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
CONNECTICUT STATEWIDE ASSESSMENT - 11TH GRADE - APRIL 1977

GOAL 4 CHARTS AND GRAPHS

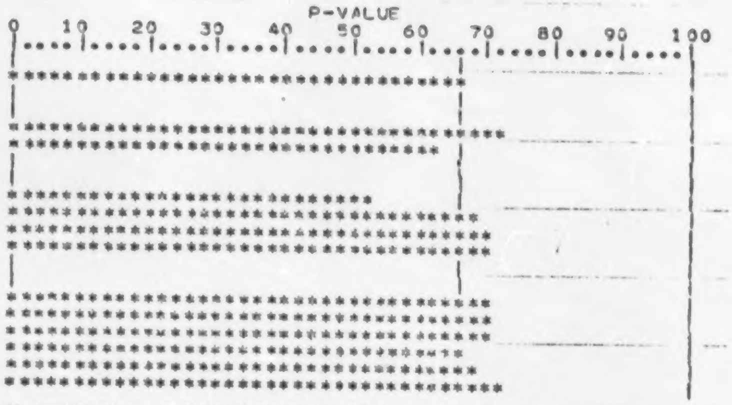
P-VALUE	SE OF P-VALUE	GROUP EFFECT	SE OF EFFECT	SAMPLE SIZE	REPORTING GROUP
93.23	0.33			2362	ALL STUDENTS
----SEX OF THE STUDENT ----					
93.83	0.47	0.59*	0.27	1021	MALE
92.80	0.39	-0.43*	0.20	1339	FEMALE
----SIZE OF THE COMMUNITY ----					
84.68	1.52	-8.56*	1.35	416	BIG CITIES
94.72	0.50	1.48*	0.45	634	FRINGE CITIES
94.65	0.50	1.41*	0.44	658	MEDIUM CITIES
94.46	0.55	1.23*	0.42	654	SMALLER PLACES
----REGION OF THE STATE ----					
94.17	0.62	0.93	0.58	357	RESCUE
95.45	0.64	2.21*	0.60	352	COOP ED SERVICE
95.08	0.51	1.84*	0.48	485	CREC
93.12	0.85	-0.11	0.75	358	ACES
94.50	0.81	1.27	0.72	329	PROJECT LEARN
96.92	0.86	3.69*	0.87	65	NARSES



NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
CONNECTICUT STATEWIDE ASSESSMENT - 11TH GRADE - APRIL 1977

GOAL 5 APPLICATIONS

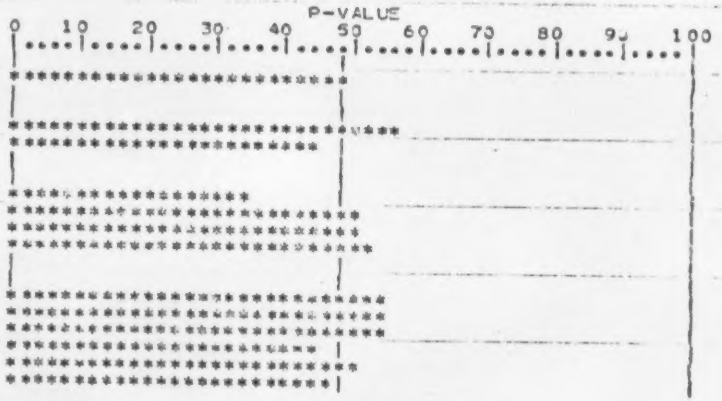
P-VALUE	SE OF P-VALUE	GROUP EFFECT	SE OF EFFECT	SAMPLE SIZE	REPORTING GROUP
66.72	0.66			2362	ALL STUDENTS
----SEX OF THE STUDENT					
71.74	0.90	5.02*	0.52	1021	MALE
62.95	0.78	-3.78*	0.39	1339	FEMALE
----SIZE OF THE COMMUNITY					
51.66	2.27	-15.07*	2.04	416	BIG CITIES
68.52	1.17	1.80	1.00	634	FRINGE CITIES
69.54	0.91	2.82*	0.88	658	MEDIUM CITIES
69.23	1.28	2.51*	0.94	654	SMALLER PLACES
----REGION OF THE STATE					
69.33	1.36	2.60*	1.26	357	RESCUE
69.93	1.45	3.21*	1.35	352	COOP ED SERVICE
70.62	1.24	3.90*	1.18	485	CREC
66.46	1.79	-0.26	1.58	358	ACES
67.78	1.63	1.05	1.47	329	PROJECT LEARN
72.91	2.60	6.18*	2.55	65	NARSES



NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
CONNECTICUT STATEWIDE ASSESSMENT - 11TH GRADE - APRIL 1977

GOAL 6 GEOMETRY

P-VALUE	SE OF P-VALUE	GROUP EFFECT	SE OF EFFECT	SAMPLE SIZE	REPORTING GROUP
48.71	0.95			2362	ALL STUDENTS
----SEX OF THE STUDENT					
55.39	1.20	6.68*	0.68	1021	MALE
43.68	1.11	-5.02*	0.49	1339	FEMALE
----SIZE OF THE COMMUNITY					
33.36	2.41	-15.35*	2.23	416	BIG CITIES
49.53	1.64	0.82	1.42	634	FRINGE CITIES
50.80	1.59	2.10	1.39	658	MEDIUM CITIES
52.64	1.89	3.94*	1.38	654	SMALLER PLACES
----REGION OF THE STATE					
53.03	1.56	4.32*	1.57	357	RESCUE
54.89	2.46	6.18*	2.23	352	COOP ED SERVICE
53.35	1.70	4.64*	1.56	485	CREC
43.97	2.58	-4.74*	2.27	358	ACES
50.55	2.80	1.85	2.47	329	PROJECT LEARN
46.54	5.92	-2.17	5.72	65	NARSES



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                NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
                  CONNECTICUT STATEWIDE ASSESSMENT - 11TH GRADE - APRIL 1977

           OBJECTIVE  1  STUDENT DEMONSTRATES UNDERSTANDING OF RATIONAL NUMBERS
                                                                                       P-VALUE
          SE OF    GROUP     SE OF   SAMPLE                                0   10   20   30   40   50   60   70   80   90   100
P-VALUE  P-VALUE  EFFECT    EFFECT   SIZE           REPORTING GROUP        |....|....|....|....|....|....|....|....|....|....|
  68.50    0.79                       2362           ALL STUDENTS           **********************************

----SEX OF THE STUDENT                       ----
  71.27    1.02     2.77*    0.65     1021           MALE                   ***********************************
  66.39    1.02    -2.11*    0.50     1339           FEMALE                 *********************************

----SIZE OF THE COMMUNITY                    ----
  56.25    2.08   -12.25*    1.92      416           BIG CITIES             ****************************
  71.57    1.25     3.07*    1.12      634           FRINGE CITIES          ***********************************
  69.23    1.42     0.73     1.20      658           MEDIUM CITIES          **********************************
  70.53    1.59     2.03     1.15      654           SMALLER PLACES         ***********************************

----REGION OF THE STATE                      ----
  70.74    1.90     2.24     1.70      357           RESCUE                 ***********************************
  74.37    1.92     5.87*    1.75      352           COOP ED SERVICE        *************************************
  72.12    1.43     3.62*    1.31      485           CREC                   ************************************
  66.66    2.04    -1.84     1.60      358           ACES                   *********************************
  67.54    2.14    -0.97     1.91      329           PROJECT LEARN          *********************************
  71.15    4.70     2.65     4.54       65           NARSES                 ***********************************
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                NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
                  CONNECTICUT STATEWIDE ASSESSMENT - 11TH GRADE - APRIL 1977

           OBJECTIVE  2  STUDENT DEMONSTRATES UNDERSTANDING OF ORDERING OF NUMBERS
                                                                                       P-VALUE
          SE OF    GROUP     SE OF   SAMPLE                                0   10   20   30   40   50   60   70   80   90   100
P-VALUE  P-VALUE  EFFECT    EFFECT   SIZE           REPORTING GROUP        |....|....|....|....|....|....|....|....|....|....|
  67.84    0.77                       2362           ALL STUDENTS           *********************************

----SEX OF THE STUDENT                       ----
  77.15    0.92     9.32*    0.58     1021           MALE                   **************************************
  60.80    0.96    -7.03*    0.42     1339           FEMALE                 ******************************

----SIZE OF THE COMMUNITY                    ----
  50.06    2.47   -17.78*    2.21      416           BIG CITIES             *************************
  70.74    1.20     2.91*    1.09      634           FRINGE CITIES          ***********************************
  69.84    1.15     2.00     1.06      658           MEDIUM CITIES          **********************************
  71.22    1.56     3.38*    1.13      654           SMALLER PLACES         ***********************************

----REGION OF THE STATE                      ----
  69.39    1.59     1.55     1.48      357           RESCUE                 **********************************
  74.60    1.63     6.77*    1.54      352           COOP ED SERVICE        *************************************
  72.98    1.22     5.14*    1.16      485           CREC                   ************************************
  66.40    2.18    -1.43     1.91      358           ACES                   *********************************
  68.55    2.07     0.71     1.85      329           PROJECT LEARN          **********************************
  73.08    3.76     5.24     3.66       65           NARSES                 ************************************
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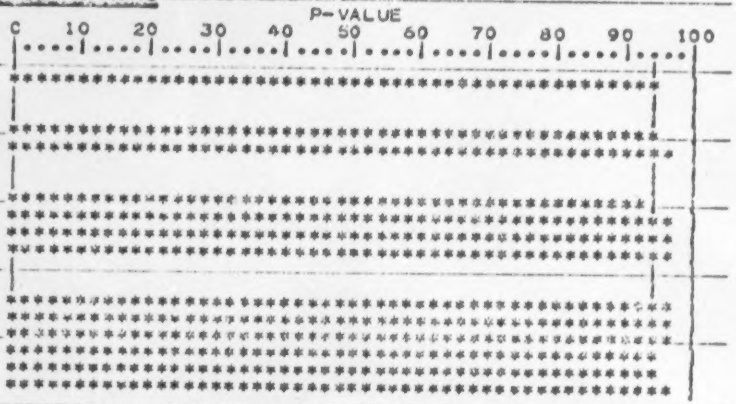
NATIONAL EVALUATION SYSTEMS. INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
CONNECTICUT STATEWIDE ASSESSMENT - 11TH GRADE - APRIL 1977

OBJECTIVE 3 STUDENT DEMONSTRATES ABILITY TO ADD AND SUBTRACT WHOLE NUMBERS

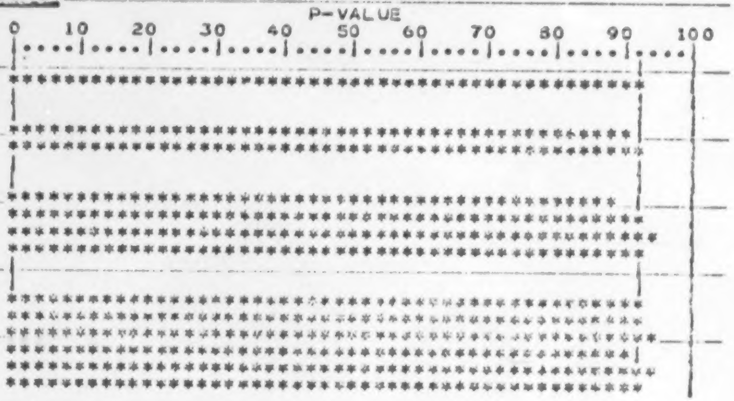
P-VALUE	SE OF P-VALUE	GROUP EFFECT	SE OF EFFECT	SAMPLE SIZE	REPORTING GROUP
94.87	0.29			2362	ALL STUDENTS
----SEX OF THE STUDENT					
94.49	0.42	-0.38	0.23	1021	MALE
95.22	0.34	0.35	0.19	1339	FEMALE
----SIZE OF THE COMMUNITY					
91.47	0.98	-3.40*	0.87	416	BIG CITIES
95.27	0.45	0.40	0.40	634	FRINGE CITIES
95.67	0.48	0.80	0.41	658	MEDIUM CITIES
95.34	0.53	0.47	0.39	654	SMALLER PLACES
----REGION OF THE STATE					
95.25	0.83	0.37	0.72	357	RESCUE
96.50	0.51	1.62*	0.49	352	COOP ED SERVICE
95.72	0.52	0.85	0.46	485	CREC
94.31	0.62	-0.56	0.57	358	ACES
94.98	0.73	0.11	0.65	329	PROJECT LEARN
96.54	1.12	1.67	1.10	65	NARSES



NATIONAL EVALUATION SYSTEMS. INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
CONNECTICUT STATEWIDE ASSESSMENT - 11TH GRADE - APRIL 1977

OBJECTIVE 4 STUDENT DEMONSTRATES ABILITY TO MULTIPLY WHOLE NUMBERS

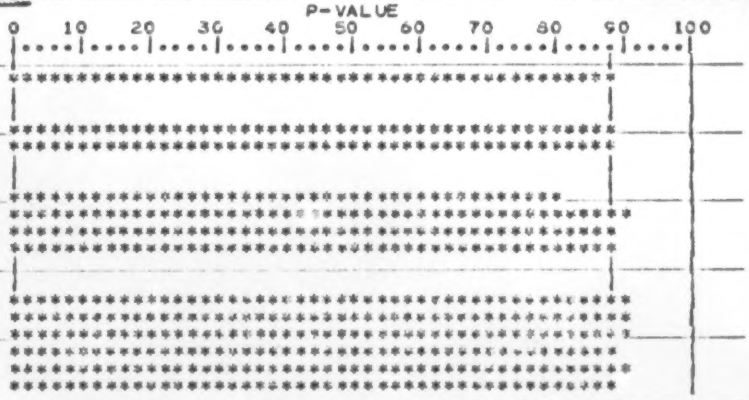
P-VALUE	SE OF P-VALUE	GROUP EFFECT	SE OF EFFECT	SAMPLE SIZE	REPORTING GROUP
91.63	0.38			2362	ALL STUDENTS
----SEX OF THE STUDENT					
90.74	0.57	-0.89*	0.34	1021	MALE
92.30	0.45	0.67*	0.24	1339	FEMALE
----SIZE OF THE COMMUNITY					
87.44	1.38	-4.19*	1.22	416	BIG CITIES
91.52	0.82	-0.11	0.65	634	FRINGE CITIES
93.05	0.54	1.42*	0.51	658	MEDIUM CITIES
92.32	0.62	0.69	0.48	654	SMALLER PLACES
----REGION OF THE STATE					
92.21	0.82	0.58	0.74	357	RESCUE
91.53	0.94	-0.00	0.84	352	COOP ED SERVICE
93.43	0.71	1.80*	0.64	485	CREC
90.73	1.00	-0.90	0.89	358	ACES
93.36	0.85	1.73*	0.77	329	PROJECT LEARN
91.15	1.88	-0.48	1.82	65	NARSES



NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
CONNECTICUT STATEWIDE ASSESSMENT - 11TH GRADE - APRIL 1977

OBJECTIVE 5 STUDENT DEMONSTRATES ABILITY TO DIVIDE WHOLE NUMBERS

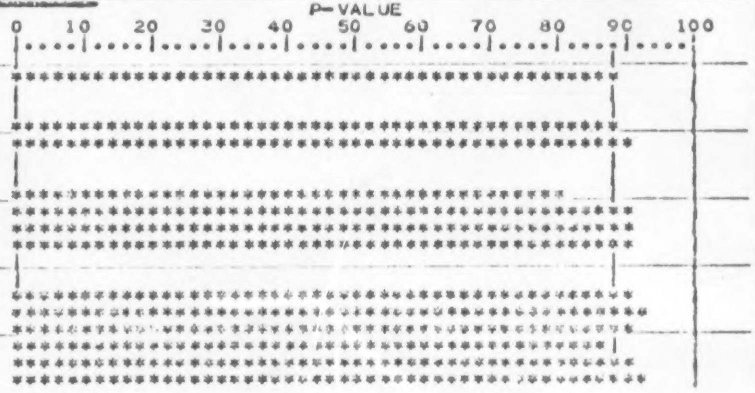
P-VALUE	SE OF P-VALUE	GROUP EFFECT	SE OF EFFECT	SAMPLE SIZE	REPORTING GROUP
87.63	0.46			2362	ALL STUDENTS
----SEX OF THE STUDENT					----
88.07	0.62	0.44	0.41	1021	MALE
87.32	0.61	-0.31	0.31	1339	FEMALE
----SIZE OF THE COMMUNITY					----
79.09	1.96	-8.54*	1.73	416	BIG CITIES
89.47	0.85	1.84*	0.69	634	FRINGE CITIES
88.61	0.64	0.98	0.59	658	MEDIUM CITIES
88.92	0.71	1.29*	0.57	654	SMALLER PLACES
----REGION OF THE STATE					----
89.20	1.16	1.57	1.01	357	RESCUE
89.44	0.79	1.81*	0.76	352	COOP ED SERVICE
89.27	0.89	1.64*	0.78	485	CREC
87.91	1.08	0.28	0.96	358	ACES
89.39	0.82	1.76*	0.78	329	PROJECT LEARN
87.31	2.19	-0.32	2.13	65	NARSES



NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
CONNECTICUT STATEWIDE ASSESSMENT - 11TH GRADE - APRIL 1977

OBJECTIVE 6 STUDENT DEMONSTRATES ABILITY TO ADD AND SUBTRACT DECIMALS

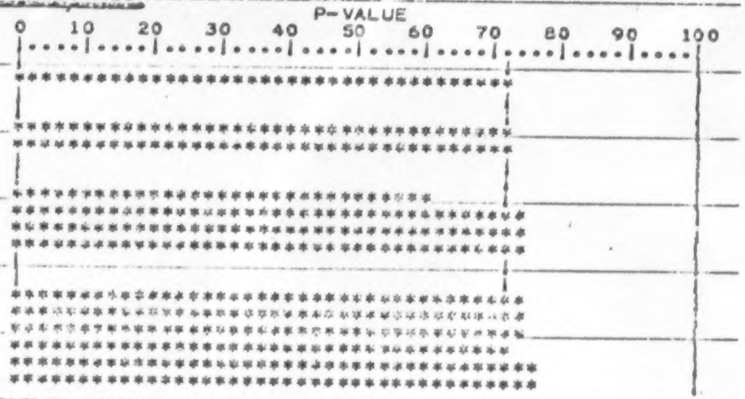
P-VALUE	SE OF P-VALUE	GROUP EFFECT	SE OF EFFECT	SAMPLE SIZE	REPORTING GROUP
88.86	0.43			2362	ALL STUDENTS
----SEX OF THE STUDENT					----
88.51	0.59	-0.35	0.38	1021	MALE
89.19	0.55	0.33	0.28	1339	FEMALE
----SIZE OF THE COMMUNITY					----
80.71	1.56	-8.15*	1.38	416	BIG CITIES
89.16	0.80	0.30	0.66	634	FRINGE CITIES
90.58	0.59	1.72*	0.55	658	MEDIUM CITIES
90.60	0.75	1.74*	0.56	654	SMALLER PLACES
----REGION OF THE STATE					----
90.72	0.64	1.86*	0.64	357	RESCUE
92.34	0.78	3.48*	0.74	352	COOP ED SERVICE
90.58	0.67	1.72*	0.63	485	CREC
86.57	1.34	-2.29*	1.16	358	ACES
90.12	0.90	1.26	0.83	329	PROJECT LEARN
91.54	2.11	2.68	2.05	65	NARSES



NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
CONNECTICUT STATEWIDE ASSESSMENT - 11TH GRADE - APRIL 1977

OBJECTIVE 7 STUDENT DEMONSTRATES ABILITY TO MULTIPLY AND DIVIDE DECIMALS

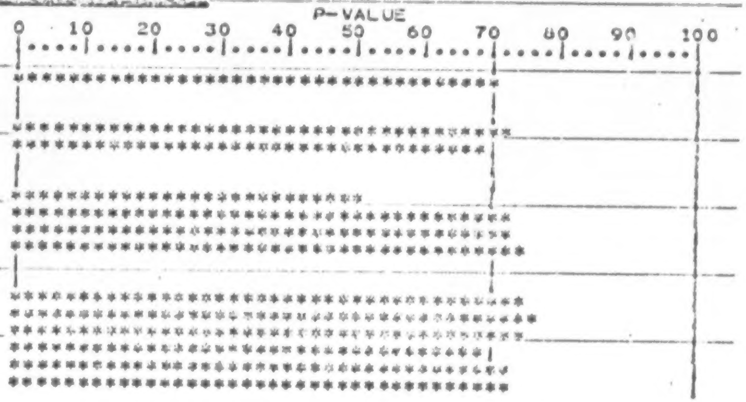
P-VALUE	SE OF P-VALUE	GROUP EFFECT	SE OF EFFECT	SAMPLE SIZE	REPORTING GROUP
72.26	0.85			2362	ALL STUDENTS
----SEX OF THE STUDENT					----
72.02	1.02	-0.24	0.58	1021	MALE
72.48	1.04	0.22	0.43	1339	FEMALE
----SIZE OF THE COMMUNITY					----
59.52	2.58	-12.64*	2.24	416	BIG CITIES
74.21	1.37	1.95	1.21	634	FRINGE CITIES
73.71	1.96	1.46	1.55	658	MEDIUM CITIES
74.74	1.29	2.48*	1.07	654	SMALLER PLACES
----REGION OF THE STATE					----
74.28	1.50	2.02	1.43	357	RESCUE
74.51	1.58	2.25	1.52	352	COOP ED SERVICE
74.62	2.00	2.37	1.70	485	CREC
71.61	1.98	-0.64	1.78	358	ACES
75.86	2.67	3.60	2.34	329	PROJECT LEARN
75.77	4.08	3.51	3.58	65	NARSES



NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
CONNECTICUT STATEWIDE ASSESSMENT - 11TH GRADE - APRIL 1977

OBJECTIVE 8 STUDENT DEMONSTRATES ABILITY TO ADD AND SUBTRACT FRACTIONS, ETC.

P-VALUE	SE OF P-VALUE	GROUP EFFECT	SE OF EFFECT	SAMPLE SIZE	REPORTING GROUP
69.40	0.94			2362	ALL STUDENTS
----SEX OF THE STUDENT					----
72.20	1.14	2.80*	0.71	1021	MALE
67.29	1.22	-2.11*	0.53	1339	FEMALE
----SIZE OF THE COMMUNITY					----
50.00	3.19	-19.40*	2.86	416	BIG CITIES
71.37	1.70	1.97	1.44	634	FRINGE CITIES
72.88	1.59	3.47*	1.39	658	MEDIUM CITIES
73.02	1.64	3.61*	1.26	654	SMALLER PLACES
----REGION OF THE STATE					----
73.77	1.69	4.37*	1.63	357	RESCUE
75.38	2.25	5.97*	2.08	352	COOP ED SERVICE
74.10	1.84	4.69*	1.64	485	CREC
67.08	2.39	-2.32	2.13	358	ACES
71.67	2.51	2.27	2.23	329	PROJECT LEARN
71.15	4.38	1.75	4.28	65	NARSES



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                   NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
                      CONNECTICUT STATEWIDE ASSESSMENT - 11TH GRADE - APRIL 1977

-------- OBJECTIVE  9  STUDENT DEMONSTRATES ABILITY TO MULTIPLY AND DIVIDE FRACTIONS, ETC. ----------------------
                                                                                             P-VALUE
           SE OF   GROUP    SE OF  SAMPLE                              0    10   20   30   40   50   60   70   80   90   100
P-VALUE  P-VALUE  EFFECT   EFFECT   SIZE        REPORTING GROUP        |....|....|....|....|....|....|....|....|....|....|
---------------------------------------------------------------------------------------------------------------------------
 72.27     0.82                     2362        ALL STUDENTS           *************************************

----SEX OF THE STUDENT                    ----
 73.18     0.98     0.90    0.60    1021        MALE                   **************************************
 71.62     1.05    -0.65    0.46    1339        FEMALE                 *************************************

----SIZE OF THE COMMUNITY                 ----
 60.22     2.17   -12.05*   2.01     416        BIG CITIES             *******************************
 74.88     1.33     2.61*   1.18     634        FRINGE CITIES          **************************************
 74.51     1.63     2.24    1.35     658        MEDIUM CITIES          **************************************
 73.40     1.55     1.13    1.16     654        SMALLER PLACES         **************************************

----REGION OF THE STATE                   ----
 75.54     1.24     3.26*   1.26     357        RESCUE                 ***************************************
 74.65     1.94     2.37    1.77     352        COOP ED SERVICE        **************************************
 74.75     1.99     2.48    1.68     485        CREC                   **************************************
 71.12     2.03    -1.15    1.82     358        ACES                   *************************************
 73.73     2.50     1.46    2.20     329        PROJECT LEARN          **************************************
 78.08     4.22     5.81    4.09      65        NARSES                 ****************************************
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                   NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
                      CONNECTICUT STATEWIDE ASSESSMENT - 11TH GRADE - APRIL 1977

-------- OBJECTIVE 10  STUDENT DEMONSTRATES WORKING KNOWLEDGE OF AREA AND PERIMETER ------------------------------
                                                                                             P-VALUE
           SE OF   GROUP    SE OF  SAMPLE                              0    10   20   30   40   50   60   70   80   90   100
P-VALUE  P-VALUE  EFFECT   EFFECT   SIZE        REPORTING GROUP        |....|....|....|....|....|....|....|....|....|....|
---------------------------------------------------------------------------------------------------------------------------
 72.95     0.78                     2362        ALL STUDENTS           *************************************

----SEX OF THE STUDENT                    ----
 78.96     0.99     6.01*   0.59    1021        MALE                   ****************************************
 68.39     0.97    -4.56*   0.44    1339        FEMALE                 ***********************************

----SIZE OF THE COMMUNITY                 ----
 52.70     3.02   -20.24*   2.68     416        BIG CITIES             ***************************
 74.09     1.31     1.15    1.15     634        FRINGE CITIES          **************************************
 75.99     1.16     3.05*   1.07     658        MEDIUM CITIES          ***************************************
 77.87     1.36     4.92*   1.05     654        SMALLER PLACES         ****************************************

----REGION OF THE STATE                   ----
 76.55     1.29     3.60*   1.28     357        RESCUE                 ***************************************
 78.54     1.57     5.60*   1.50     352        COOP ED SERVICE        ****************************************
 77.56     1.26     4.61*   1.21     485        CREC                   ****************************************
 71.46     2.27    -1.49    1.97     358        ACES                   *************************************
 74.68     2.01     1.73    1.81     329        PROJECT LEARN          **************************************
 82.69     1.96     9.74*   2.00      65        NARSES                 ******************************************
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         NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
                CONNECTICUT STATEWIDE ASSESSMENT - 11TH GRADE - APRIL 1977

          OBJECTIVE 11  STUDENT DEMONSTRATES ABILITY TO CONVERT U.S. UNITS OF MEASURE
                                                                                                        P-VALUE
          SE OF    GROUP     SE OF   SAMPLE                                    0    10   20   30   40   50   60   70   80   90   100
P-VALUE  P-VALUE   EFFECT   EFFECT    SIZE          REPORTING GROUP            |....|....|....|....|....|....|....|....|....|....|
 85.87    0.57                        2362          ALL STUDENTS               *******************************************

----SEX OF THE STUDENT                       ----
 89.87    0.62      4.00*    0.44     1021          MALE                       *********************************************
 82.84    0.80     -3.03*    0.34     1339          FEMALE                     *****************************************

----SIZE OF THE COMMUNITY                    ----
 70.67    2.49    -15.20*    1.16      416          BIG CITIES                 ***********************************
 86.95    0.79      1.08     0.75      634          FRINGE CITIES              *******************************************
 89.18    0.78      3.31*    0.75      658          MEDIUM CITIES              *********************************************
 88.61    0.94      2.74*    0.75      654          SMALLER PLACES             ********************************************

----REGION OF THE STATE                      ----
 88.57    1.19      2.70*    1.11      357          RESCUE                     ********************************************
 86.46    1.14      0.59     1.07      352          COOP ED SERVICE            *******************************************
 89.48    0.86      3.61*    0.84      485          CREC                       *********************************************
 87.49    1.48      1.61     1.32      358          ACES                       ********************************************
 88.53    1.07      2.66*    1.02      329          PROJECT LEARN              ********************************************
 90.00    1.67      4.13*    1.68       65          NARSES                     *********************************************


         NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
                CONNECTICUT STATEWIDE ASSESSMENT - 11TH GRADE - APRIL 1977

          OBJECTIVE 12  STUDENT DEMONSTRATES KNOWLEDGE OF METRIC UNITS OF MEASURE
                                                                                                        P-VALUE
          SE OF    GROUP     SE OF   SAMPLE                                    0    10   20   30   40   50   60   70   80   90   100
P-VALUE  P-VALUE   EFFECT   EFFECT    SIZE          REPORTING GROUP            |....|....|....|....|....|....|....|....|....|....|
 82.19    0.74                        2362          ALL STUDENTS               *****************************************

----SEX OF THE STUDENT                       ----
 88.83    0.75      6.63*    0.55     1021          MALE                       ********************************************
 77.13    1.02     -5.06*    0.42     1339          FEMALE                     ***************************************

----SIZE OF THE COMMUNITY                    ----
 64.06    2.71    -18.13*    2.40      416          BIG CITIES                 ********************************
 83.52    1.24      1.32     1.09      634          FRINGE CITIES              ******************************************
 85.87    1.04      3.68*    0.97      658          MEDIUM CITIES              *******************************************
 85.63    1.27      3.44*    0.99      654          SMALLER PLACES             *******************************************

----REGION OF THE STATE                      ----
 84.92    1.46      2.73*    1.39      357          RESCUE                     ******************************************
 88.07    1.45      5.87*    1.39      352          COOP ED SERVICE            ********************************************
 86.27    1.04      4.08*    1.03      485          CREC                       *******************************************
 81.15    2.12     -1.04     1.67      358          ACES                       *****************************************
 84.41    1.79      2.22     1.62      329          PROJECT LEARN              ******************************************
 85.39    3.57      3.19     3.48       65          NARSES                     *******************************************
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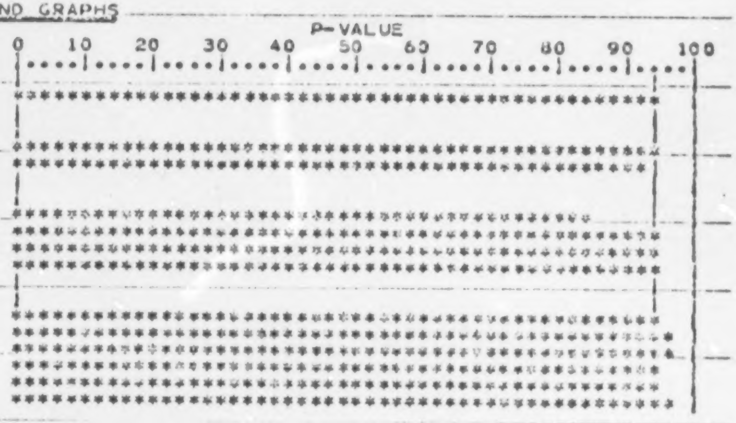
NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
CONNECTICUT STATEWIDE ASSESSMENT - 11TH GRADE - APRIL 1977

OBJECTIVE 13 STUDENT DEMONSTRATES ABILITY TO INTERPRET CHARTS AND GRAPHS

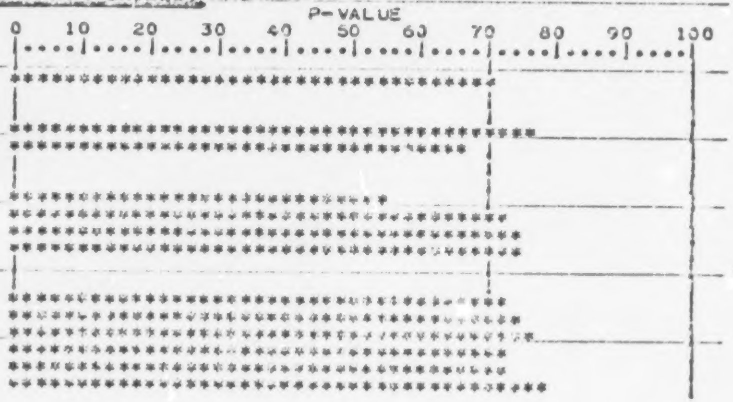
P-VALUE	SE OF P-VALUE	GROUP EFFECT	SE OF EFFECT	SAMPLE SIZE	REPORTING GROUP
93.23	0.33			2362	ALL STUDENTS
----SEX OF THE STUDENT					
93.53	0.47	0.59*	0.27	1021	MALE
92.80	0.39	-0.43*	0.20	1339	FEMALE
----SIZE OF THE COMMUNITY					
84.68	1.52	-8.56*	1.35	416	BIG CITIES
94.72	0.50	1.48*	0.45	634	FRINGE CITIES
94.65	0.50	1.41*	0.44	658	MEDIUM CITIES
94.46	0.55	1.23*	0.42	654	SMALLER PLACES
----REGION OF THE STATE					
94.17	0.62	0.93	0.58	357	RESCUE
95.45	0.64	2.21*	0.60	352	COOP ED SERVICE
95.08	0.51	1.84*	0.48	483	CREC
93.12	0.85	-0.11	0.75	358	ACES
94.50	0.81	1.27	0.72	329	PROJECT LEARN
96.92	0.86	3.69*	0.87	65	NARSES



NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
CONNECTICUT STATEWIDE ASSESSMENT - 11TH GRADE - APRIL 1977

OBJECTIVE 14 STUDENT DEMONSTRATES ABILITY TO SOLVE WORD PROBLEMS (MATH SKILLS)

P-VALUE	SE OF P-VALUE	GROUP EFFECT	SE OF EFFECT	SAMPLE SIZE	REPORTING GROUP
70.91	0.73			2362	ALL STUDENTS
----SEX OF THE STUDENT					
76.30	0.95	5.39*	0.58	1021	MALE
66.84	0.91	-4.07*	0.44	1339	FEMALE
----SIZE OF THE COMMUNITY					
54.21	2.61	-16.70*	2.34	416	BIG CITIES
72.52	1.24	1.60	1.08	634	FRINGE CITIES
74.02	0.93	3.11*	0.92	658	MEDIUM CITIES
74.01	1.45	3.10*	1.06	654	SMALLER PLACES
----REGION OF THE STATE					
72.41	1.66	1.50	1.51	357	RESCUE
74.53	1.48	3.62*	1.39	352	COOP ED SERVICE
75.33	1.36	4.41*	1.22	485	CREC
71.03	2.05	0.12	1.81	358	ACES
72.73	1.81	1.81	1.63	329	PROJECT LEARN
78.85	2.61	7.94*	2.58	65	NARSES



NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
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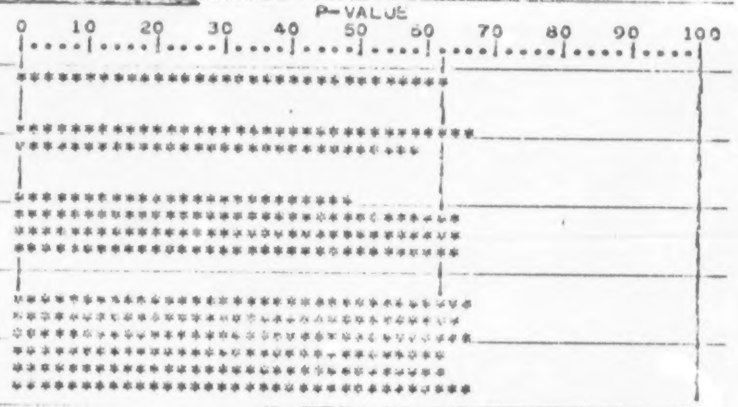
OBJECTIVE 15 STUDENT DEMONSTRATES ABILITY TO SOLVE WORD PROBLEMS (REAL WORLD)

P-VALUE	SE OF P-VALUE	GROUP EFFECT	SE OF EFFECT	SAMPLE SIZE	REPORTING GROUP
62.08	0.71			2362	ALL STUDENTS
----SEX OF THE STUDENT					
66.76	1.07	4.68*	0.66	1021	MALE
58.57	0.86	-3.51*	0.49	1339	FEMALE
----SIZE OF THE COMMUNITY					
48.68	2.10	-13.40*	1.89	416	BIG CITIES
64.04	1.30	1.96	1.08	634	FRINGE CITIES
64.59	1.14	2.52*	1.02	658	MEDIUM CITIES
64.03	1.37	1.95	1.00	654	SMALLER PLACES
----REGION OF THE STATE					
65.80	1.39	3.72*	1.30	357	RESCUE
64.86	1.74	2.78	1.57	352	COOP ED SERVICE
65.47	1.56	3.39*	1.34	485	CREC
61.42	1.82	-0.66	1.61	358	ACES
62.37	1.68	0.29	1.52	329	PROJECT LEARN
66.54	5.03	4.46	4.84	65	NARSES



NATIONAL EVALUATION SYSTEMS, INC. -- CONTENT ANALYSIS BY REPORTING GROUPS
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OBJECTIVE 16 STUDENT DEMONSTRATES KNOWLEDGE OF BASIC GEOMETRIC CONCEPTS

P-VALUE	SE OF P-VALUE	GROUP EFFECT	SE OF EFFECT	SAMPLE SIZE	REPORTING GROUP
48.71	0.95			2362	ALL STUDENTS
----SEX OF THE STUDENT					
54.39	1.20	5.68*	0.68	1021	MALE
43.68	1.11	-5.02*	0.49	1339	FEMALE
----SIZE OF THE COMMUNITY					
33.35	2.41	-15.35*	2.23	416	BIG CITIES
49.53	1.64	0.82	1.42	634	FRINGE CITIES
50.80	1.59	2.10	1.39	658	MEDIUM CITIES
52.64	1.29	3.94*	1.38	654	SMALLER PLACES
----REGION OF THE STATE					
53.03	1.86	4.32*	1.57	357	RESCUE
54.89	2.46	6.18*	2.23	352	COOP ED SERVICE
53.35	1.70	4.64*	1.80	485	CREC
43.97	2.58	-4.74*	2.27	358	ACES
50.55	2.60	1.85	2.47	329	PROJECT LEARN
46.54	5.92	-2.17	5.72	65	NARSES